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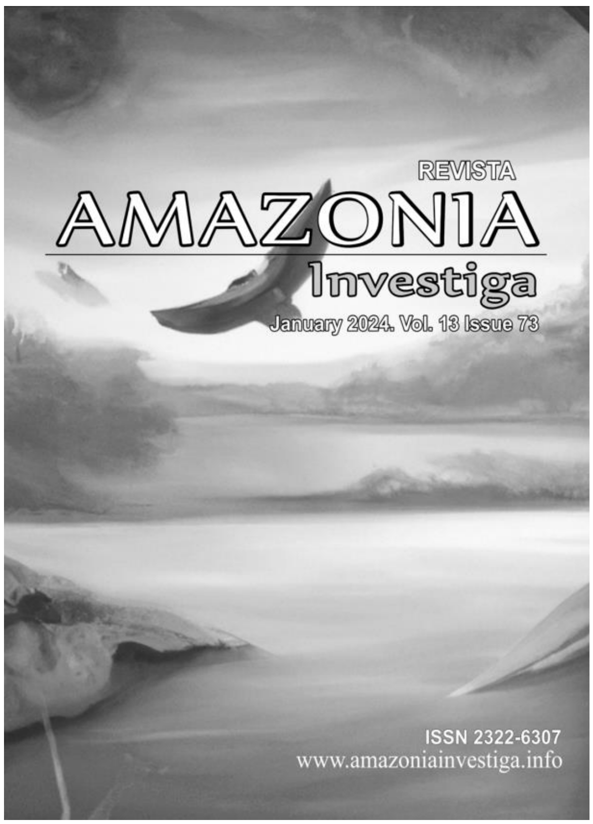

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Development of virtual learning systems based on artificial intelligence: International experience

Vývoj virtuálních výukových systémů založených na umělé inteligenci: Mezinárodní zkušenosti

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Abstract

The aim of the article is to study and improve the use of artificial intelligence in education by analysing international experience. The main methods used were general scientific methods, documentary analysis, standard statistics, and factor analysis. The study's main results demonstrate the rapid growth in the popularity of artificial intelligence in virtual learning systems in all the countries under consideration. The article reveals a tendency to increase the demand for these technologies. The study concludes that AI has an important role in the educational process and that future research should focus on evaluating its effectiveness in training specific specialists.

Keywords: education, innovative learning, students, development, university.

Abstraktní

Cílem článku je prostudovat a zlepšit využití umělé inteligence ve vzdělávání pomocí analýzy mezinárodních zkušeností. Hlavními používanými metodami byly obecné vědecké metody, dokumentární analýza, standardní statistika a faktorová analýza. Hlavní výsledky studie ukazují rychlý růst popularity umělé inteligence ve virtuálních výukových systémech ve všech sledovaných zemích. Článek odhaluje tendenci zvyšovat poptávku po těchto technologiích. Studie dochází k závěru, že umělá inteligence hraje důležitou roli ve vzdělávacím procesu a že budoucí výzkum by se měl zaměřit na hodnocení její účinnosti při školení konkrétních specialistů.

Klíčová slova: vzdělávání, inovativní učení, studenti, rozvoj, univerzita.

Introduction

Artificial intelligence (AI) has changed how we perceive technology and its capabilities in various areas of life. According to a UNESCO policy brief, using AI in education will "reduce the time spent preparing for classes, develop creative and innovative methods to improve the level of knowledge acquisition and select individual educational trajectories for students" (Duggan, 2020).

The study aims to understand and improve AI-based learning systems by analysing international experience.

Based on the goal, the following tasks can be identified:

1. Study the dynamics of demand for virtual learning systems based on AI.

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2. Study of the development of virtual learning systems based on AI in 2022.

The object of research is innovative virtual learning systems based on AI, considering international experience in this field.

The article includes an introduction and a literature review covering the latest research. The Methodology section will provide details of the procedure and methods, while the Results and Discussion will provide an understanding of what the study's findings are based on.

The main focus of the research is to study best practices, trends and innovations in the use of AI in educational systems. By analysing experiences globally to design virtual learning systems that address modern educational needs and leverage best practices in AI.

Literature review

The study by Salas-Pilco & Yang (2022) systematically examines the use of artificial intelligence in Latin American educational institutions using a meta-analysis of various implementation cases. They found significant interest in using AI to support educational processes but emphasized the existing infrastructure and access to resources that hinder widespread adoption. This study also points to a lack of empirical data on the impact of AI on educational outcomes, emphasizing the need for further research in this area.

On the other hand, Rios-Campos et al. (2023) explore the challenges and prospects of using AI in South Florida educational institutions, with a focus on the potential for personalizing learning and improving pedagogical methods. They identify key barriers, such as high cost, ethical issues, and data privacy concerns, that require strategies to be developed for effective AI adoption.

Chen, Chen & Lin (2020) emphasize the rapid development of AI and its potential to improve virtual learning systems. They point out that new machine learning and natural language processing algorithms allow for the creation of intelligent, personalized, and effective educational systems.

The experience of the HUSPOL Academy's teachers demonstrates the ability of AI to solve numerous problems in education, ensuring the creation of personalized curricula that take into account the needs and abilities of each student. According to HolonIQ (2022), this approach makes learning more effective and aligns with students' personal goals.

Alam (2022) emphasizes the use of intelligent analytical tools to assess student performance, identify their strengths and weaknesses, and provide recommendations for improving the learning process. This helps automate administrative tasks such as course registration and grading, freeing up staff time to work more effectively with students.

The identified trends include a growing interest in integrating AI into educational processes to personalize learning, optimize administrative tasks, and improve teaching efficiency. However, current gaps, such as limited research on the impact of AI on educational outcomes, ethical and privacy concerns, and infrastructure and access issues, require additional attention. The need for this research stems from the need to understand how AI can be effectively integrated into curricula while addressing these challenges. This includes developing strategies to overcome existing barriers and exploit the potential of AI to improve educational practices.

Methodology

The study was conducted in several stages. The stages are shown in Figure 1. The study was based on the following sources: Research and Markets (2022), HolonIQ (2022), European Commission (2022), and the OECD (2023). These sources made it possible to analyse the problem under consideration in the dynamics of its development and draw conclusions. The study uses general scientific research methods: analysis, synthesis, and documentary analysis. Standard statistics and factor analysis were used. The Alpha-Cronbach reliability coefficient was used to examine the internal consistency of the data obtained. Tools such as Microsoft Excel and Google Sheets were used for statistical calculations. All the results and conclusions obtained meet the requirements of academic integrity, validity, and reliability. The study's authors did not receive funding from stakeholders or declare any conflict of interest.

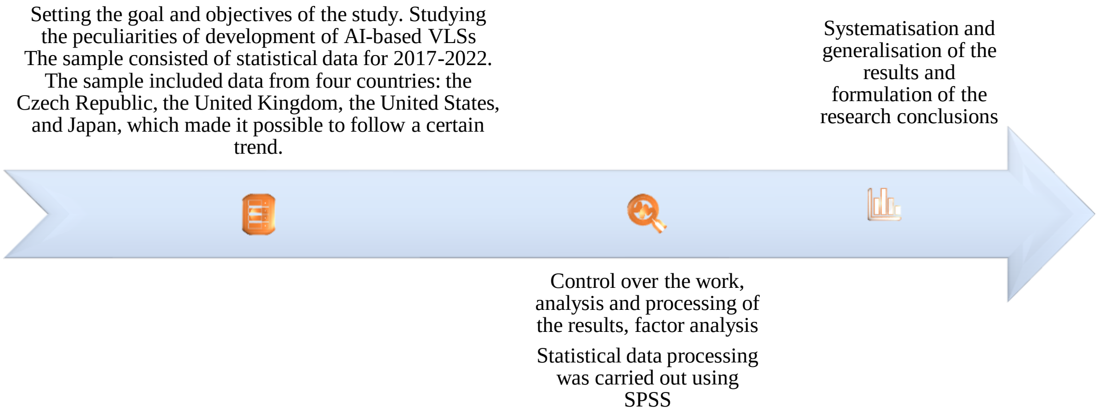

Figure 1. Stages of the study.

Results

At the beginning of the study, we should pay attention to the dynamics of demand for AI-based VLSs in the Czech Republic, the UK, the US, and Japan by the number of users. The results of the study are presented in Table 1.

Table 1.
Dynamics of demand for virtual learning systems based on artificial intelligence (2017-2022) in users

Country	2017	2018	2019	2020	2021	2022	Forecast for 2023
Czech Republic	10 K	20 K	30 K	50 K	75 K	100 K	150 K
United Kingdom	100 K	200 K	300 K	400 K	600 K	500 K	750 K
USA	1 mln	2 mln	3 mln	5 mln	7 mln	10 mln	15 mln
Japan	100 K	200 K	300 K	400 K	600 K	1 mln	1.5 mln

Source: Developed based on sources: Research and Markets (2022), HolonIQ (2022), European Commission (2022) and OECD (2023)

Table 1 shows that the demand for VLSs grew significantly between 2017 and 2022 in all the countries considered. The trend is clear: demand is growing. In all countries, there has been a steady and significant increase in users during the period under review.

Next, we should pay attention to the development of AI-based VLSs by considering such indicators as the number of users, investments, number of startups, and the most common areas of use. The research results are presented in Table 2.

Table 2.
Development of virtual learning systems based on artificial intelligence in 2022

Country	Number of users	Investments	Number of startups
Czech Republic	100 000	€10 mln	20
United Kingdom	500 000	£50 mln	50
USA	Ten mln	$1 bln	100
Japan	1 mln	¥10 bln	30

Source: Developed based on sources: Research and Markets (2022), HolonIQ (2022), European Commission (2022) and OECD (2023)

The analytical Table 2 shows that in 2022, we can observe a general trend towards a significant development of VLSs in all the countries under consideration. Each has a substantial number of users and significant investments in this area. There is an active development of startups working in virtual learning. Table 3 shows the results of the factor analysis.

Table 3.
Factor analysis of the development of virtual learning systems based on artificial intelligence (2017-2022)

Factor	Impact on development	Quantification	Dynamics	Country
Investments	Increased investment stimulates the development of new systems and technologies	€1 million -> €10 million (Czech Republic)	Growth	All countries
Number of startups	The growth in the number of startups indicates	5 -> 20 (Czech Republic)		
Research and development	New research and development improves existing systems	Growth of publications		
Internet accessibility	Increasing accessibility of the Internet raises potential audience	70% -> 85% (Czech Republic)		

Source: Developed based on sources: Research and Markets (2022), HolonIQ (2022), European Commission (2022) and OECD (2023)

Table 3 provides an overview of the factors influencing the development of AI-based virtual learning systems from 2017 to 2022. It highlights the factors driving this process, including investment, the number of startups, research and development, internet availability, demand for online learning, government support, and competition. It also points to challenges that could slow the process, such as legal and ethical issues.

Learning systems based on artificial intelligence show prospects for increasing learning effectiveness, personalising the learning process and engaging students. However, problematic technical aspects, data confidentiality, and access to technologies were identified.

Discussion

The study showed that the Czech Republic, as one of the countries under study, shows a significant increase in investment, the number of startups, internet accessibility, and demand for online learning. As the survey by Kabudi, Pappas and Olsen (2021) highlights, AI is now essential in education. The authors emphasise that it opens up new opportunities for personalising learning, helping everyone develop at their own pace and according to their needs and abilities. As Mastan, Sensuse, Suryono & Kautsarina (2022) highlight, AI creates innovative teaching methods that ensure more effective learning. It also helps to focus on individualised guidance and support. AI also contributes to developing new assessment methods and provides access to quality education anywhere. But, as noted by Cheung, Kwok, Phusavat & Yang (2021), AI can become a factor of abuse and academic dishonesty if not used correctly.

The practical significance of the article lies in studying and analysing the factors that influence the development of AI-based VLSs. The theoretical relevance lies in expanding scientific knowledge about the use of AI in education. Limitations of the study include the limited number of countries studied or the limited data and methodologies used.

Conclusions

The study analysed the development of AI-based VLSs and their international application experience. The results showed a stable and significant increase in the popularity and demand for such systems in all the countries under consideration. Investment, the number of startups, research and development, internet accessibility, demand for online learning, government support and competition have been vital factors influencing this development.

Recommendations

Recommendations for the future use of AI in education include the development of ethical standards, ensuring accessibility and continuous improvement of systems. Future research should focus on developing a general methodology for training teaching staff to use AI in education.

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Teachers' perspectives on parental participation in the Individual Educational Program for students with intellectual disabilities

وجهات نظر المعلمين حول مشاركة أولياء الأمور في البرنامج التربوي الفردي للطلاب ذوي الإعاقة الفكرية

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Abstract

This study sought to investigate the factors influencing parental participation in the IEP for students with intellectual disabilities from educators' perspectives, while discerning any statistically significant differences based on gender, academic qualifications, experience, and training courses. The descriptive method was used, via a two-part questionnaire, with the first section collecting demographic information while the second part containing 24 items dealing with factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from teachers' perspectives. The findings indicated factors that play a role in activating parental participation in the IEP process can be classified into three types: factors related to parents, the teacher, or the educational institution. This study highlighted the importance of teacher awareness regarding the benefits of parental participation in their children's IEPs. No differences were found between male and female teachers regarding the factors contributing to the activation of parental participation in the IEP. Conversely, significant differences were found by qualification. Teachers who had attained PhDs proved to be more aware of the factors contributing to the activation of parental participation in the IEP. The findings of the study will provide educators and parents with information regarding parental involvement in the IEP process

Keywords: perspectives, parental participation, Individual Educational Program (IEPs).

المستخلص

هدفت الدراسة إلى التحقق من العوامل المساهمة في تفعيل مشاركة أولياء الأمور في البرنامج التربوي الفردي للطلاب ذوي الإعاقة الفكرية من وجهة نظر معلميهم مع التحقق من وجود فروق ذات دلالة إحصائية وفقا للمتغيرات التالية، الجنس والمؤهلات العلمية والخبرة والدورات التدريبية. تم استخدام المنهج الوصفي وتم استخدام استبانة مكونة من جزأين، الجزء الأول خاص بجمع المعلومات الديموغرافية، بينما يحتوي الجزء الثاني على 24 فقرة تتناول العوامل المساهمة في تفعيل مشاركة أولياء الأمور في برنامج التعليم الفردي للطلبة ذوي الإعاقة الفكرية من وجهة نظر المعلمين. أشارت النتائج إلى أن العوامل التي تلعب دوراً في تفعيل مشاركة أولياء الأمور في عملية برنامج التعليم الفردي يمكن تصنيفها إلى ثلاثة أنواع: عوامل تتعلق بأولياء الأمور، أو المعلم، أو المؤسسة التعليمية. مع الأخذ بعين الاعتبار أن الدراسة أبرزت أهمية وعي المعلمين فيما يتعلق بفوائد مشاركة أولياء الأمور في البرامج التربوية الفردية لأبنائهم. وأشارت النتائج إلى أنه لا توجد فروق بين المعلمين والمعلمات فيما يتعلق بالعوامل التي تساهم في تفعيل مشاركة أولياء الأمور في البرامج التربوية الفردية. وعلى العكس من ذلك، تم العثور على اختلافات كبيرة حسب المؤهلات العلمية حيث أثبت المعلمون الحاصلون على درجة الدكتوراه أنهم أكثر وعيًا بالعوامل التي تساهم في تفعيل مشاركة أولياء الأمور في البرامج التربوية الفردية. ستزود نتائج الدراسة المعلمين وأولياء الأمور بالمعلومات المتعلقة بمشاركة الوالدين في عملية برنامج التعليم الفردي (IEP).

الكلمات الدالة: وجهات نظر؛ مشاركة الوالدين؛ البرنامج التربوي الفردي (IEPs).

Introduction

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Students with special needs in public schools require customized education plans, which are a part of their overarching Individualized Education Program (IEP). It is imperative all relevant stakeholders are involved and present during the IEP process, including the creation of the individualized plan, as well as during the meetings, to ensure the best plan is created and executed for individuals with disabilities (Sanderson, 2023). However, while experts with years of experience are key participants in the development of IEPs, parents or guardians also have an important role as they help teachers and policymakers know the target students better (Alquraini, 2019). Notably, the Individuals with Disabilities Education Act (IDEA, 2004) highlights the vital role of parents or legal guardians of students with disabilities as integral members of the IEP team. Parental involvement, according to Sanderson (2023), enables IEP programs to be more personalized and better tailored to the needs of the target students by helping to identify the various needs and interests of their children. This illustrates the significance of parental participation in the individual educational program (IEP) as it translates assessment procedures into tailored annual programs based on the students' unique needs. Parental involvement also encourages ongoing evaluation and the selection of appropriate services, while actively engaging parents of students with intellectual disabilities within the multidisciplinary team (Yahya, 2017).

Parents hold a central position in the IEP team, as they possess comprehensive knowledge of their child's strengths, weaknesses, learning strategies, preferences, interests, and motivating factors that play a key role in improving the effectiveness of IEP initiatives (Alquraini, 2019). As noted earlier, the core objective of the individual educational program is to enhance the social and personal competence of individuals with intellectual disabilities, recognizing their potential to benefit from standard educational programs, albeit to a lesser extent than typical students (Alquraini, 2019; Sanderson, 2023). Parents are often knowledgeable of their child's critical goals, making them a key source of information to share with other team members.

As with any educational policy, the development of individual educational programs hinges on organized teamwork among team members, leveraging their specialized experiences to meet students' needs comprehensively (Sanderson, 2023). Effective collaboration is key to successful IEP implementation, emphasizing the importance of fostering positive working relationships within the multidisciplinary team for optimal outcomes for both the child and the family (Alquraini & Gut, 2012). Parental teamwork and collaboration is an integral part of this process (Al-Dosari & Al-Hano, 2018).

However, despite the important role of parents in these programs, their involvement is faced with a number of barriers and challenges that often have a negative impact on program success (Alquraini, 2019; Scanlon et al., 2017). For example, teachers have a lot of responsibilities with a heavy work-load and their time available to allocate to parents is limited, specifically to focus on the specific needs and strengths of each individual student (Hornby & Blackwell, 2018). The involvement of parents can also cause unwanted division between students with special needs and their parents, as they may have difficulty accurately expressing their thoughts regarding students' needs, strengths, and interests. Conversely, some parents are unaware of their student's specific needs, so their participation is not effective (Hornby & Blackwell, 2018). Additionally, some students are not honest and straightforward with their parents, so students' reflection of their day and their achievements at school may not provide an accurate depiction of what is actually occurring (Hornby & Blackwell, 2018). Therefore, parents' IEP participation may not be helpful in these cases. Despite the aforementioned challenges, Al-Dosari & Al-Hano (2018) express the crucial need for parental involvement in students' IEPs. Regardless of research affirming the importance of parental participation, Al-Otaibi (2009) found insufficient involvement by parents in the IEP of their student.

While collaboration between parents, teachers, and support providers is essential for crafting an educational plan aligned with the student's abilities, challenges also often emerge during the development of individualized programs and plans, leading to infrequent positive experiences during IEP meetings (Scanlon et al., 2017). These meetings are sometimes described as contentious, with parents advocating strenuously to secure services for their children with disabilities (Blackwell & Rosetti, 2014; Burke & Hodapp, 2014). Al-Dosari & Al-Hano's (2018) study identified differing perspectives on the obstacles to parental participation, with teachers highlighting parents' lack of confidence in the effectiveness of their involvement, while parents believed that teachers dismissed their contributions to educational program planning. Zeitlin & Curcic's (2014) surmised the discrepancy and varying perspectives of teachers and parents could be due to their different areas of expertise, as educators and administrators are trained and highly educated on how to teach students with special needs, while parents are knowledgeable of their child's individual needs and strengths.

This study aims to investigate the factors influencing parental participation in the IEP for students with intellectual disabilities from educators' perspectives. It also seeks to discern any statistically significant differences based on variables, such as gender, academic qualifications, experience, and training courses, all at a significance level of ($\alpha = 0.05$). The findings of the study will provide educators and parents with information regarding parental involvement in the IEP process, which could improve the IEP process for educators, parents, and administrators. Enhancing the IEP process and ensuring students with disabilities receive a a supportive and inclusive learning environment also has the potential to improve the learning experience for students.

Research questions

- From the perspective of teachers in Taif City, what factors play a role in stimulating parental involvement in the individualized educational programs for students with intellectual disabilities?
- What are the key factors that promote parental engagement in individualized educational programs for students with intellectual disabilities among teachers in Taif city?

Literature review

According to a study by Al-Qadi (2019), there are numerous challenges hindering the effective implementation of these IEPs. Conducted among teachers working with students with learning difficulties in general education schools in Riyadh, this study, utilizing descriptive-analytical methodology, encompassed 456 participants. Several distinctive challenges were brought to light, including the absence of assistant teachers in classrooms, a notable lack of competence among those involved in individual educational programs, and variations in the preparation of individual educational plans for different students (Al-Qadi, 2019). Furthermore, a lack of well-defined protocols for team meetings in the preparation of these programs and disparities in viewpoints among female teachers and educational supervisors regarding individual educational programs within schools were also revealed (Al-Qadi, 2019). The study also exposed insufficient familiarity with the regulatory guide for special education, inadequate collaboration among teachers (particularly in language and mathematics), and teachers' resistance to accepting input from others in the preparation of individual educational programs. This study, which is also in Saudi Arabia similar to the current research, implies gender could be an influencing factor contributing to the implementation of IEPs. However, the current research is needed, as it provides a unique perspective focusing on parental involvement.

Rashid and Wong (2023) similarly found teachers were lacking in their knowledge, skill, and attitudes regarding IEPs (Rashid & Wong, 2023). The results revealed a lack of adequate knowledge about IEPs (f = 3; 42%) as one of the biggest barriers that affect the implementation of IEPs. This can be attributed to the fact that while teachers generally recognize the unique needs of students with learning disabilities, they generally lack the skills needed to meet their needs since they are often trained with a focus on the general student population. A general lack of motivation (f = 4; 66%) among teachers was also discovered with respect to the implementation of IEPs. While teachers generally appreciate the need to meet the unique needs of students with disabilities, there is often a general lack of commitment beyond basic recognition and support for students with learning disabilities (Rashid & Wong, 2023). These challenges could be attributed to teachers' extensive responsibilities, high work-load, and limited time, as Hornby & Blackwell (2018) found teachers to have little extra time to allocate to students' individual needs. However, these studies are only about the implementation of IEPs rather than parental involvement, which warrants the current research.

Al-Dosari & Al-Hano's (2018) study aimed to assess parental involvement in IEPs for individuals with intellectual disabilities, as perceived by both teachers and parents themselves. The study also delved into the significance of parental participation in the success of these programs and identified the barriers impeding parental involvement. This research included a sample of 156 teachers and 30 guardians of students with intellectual disabilities in schools across the southern governorates of the Riyadh region (Al-Dosari & Al-Hano, 2018). The study's key findings highlighted the critical role of parental participation in achieving the intended objectives of individual educational programs for students with intellectual disabilities (Al-Dosari & Al-Hano, 2018). Notably, when exploring the obstacles to parental involvement, teachers believed that parents were deterred from participating, due to a belief that their contributions might not yield positive results for their children. The study further proposed recommendations aimed at improving the impact of parental participation in individual educational programs for children with intellectual disabilities. This implies teachers perceived inaccurate perceptions by parents to be a contributing factor in parental participation in the IEP process. Therefore, training and education to remove inaccurate views could be beneficial and improve parental involvement. More research is needed to affirm these findings.

Tamzarian et al. (2012) substantiated the need for parental involvement with regards to individualized education programs in their integrative review study, which assessed previous literature on this topic. Their findings indicated cross-cultural communication was one of the primary challenges to effective parental participation. Tamzarian et al. (2012) affirmed the need for cross cultural communication in the development of IEPs, as bureaucratic procedures, communication styles, including both verbal and nonverbal, and cultural assumptions regarding disabilities and education can all be challenges in the creation of the IEP and the process itself, as well.

It is imperative that there is not any mis-communication in this process. In school settings, parents from minority ethnic groups such as immigrants and native populations often face significant communication barriers owing to the fact that cultural trends in local communities, including communication, are often influenced by the dominant culture. It seems an empathetic approach is needed to improve communication and break down any barriers inhibiting parental participation during the creation and implementation of students' IEP. This provides implications for the current research as well, suggesting effective communication could promote parental engagement for students on IEPs for all students, but especially those who are an ethnic minority.

Lehman (2018) also called for a proactive approach after conducting a review study to examine current trends in the efforts to raise parental involvement following the implementation of IDEA 2004. Their research substantiated the need for parental involvement during the entire IEP. The researchers found parents utilized a passive approach (Lehman, 2018). This substantiates the findings by Rashid & Wong (2023), which found parents were not particularly motivated to be involved with their children's IEP. Therefore, the authors recommend parents take on a proactive approach to their child's education process (Lehman, 2018). Conversely, Barrera-Osorio et al. (2020) proposed low-cost, group-based interventions as a potential strategy for improving parental involvement. This was a randomized controlled trial study that used data from previous interventions conducted in Mexico. The first phase of the study involved providing financial resources to parent associations as a source of motivation to enhance their involvement in school educational programs. The second phase of the research project involved providing information to parents regarding potential strategies that they could use to improve their children's learning. Findings showed that the first intervention had varying outcomes, including provision of financial resources and increased awareness among parents (Barrera-Osorio et al., 2020). On the other hand, the second intervention was found to have a significant impact on parental involvement, especially among native populations whose children were likely to face learning difficulties due to discrimination or social exclusion (Barrera-Osorio et al., 2020). These findings provide implications for the current study, suggesting the provision of information regarding effective strategies could lead to increased parental involvement. Additional research is needed to affirm these findings.

Methodology

To identify the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from their teachers' perspectives, the researcher used the descriptive method. Defined by Al-Assaf (2012, p. 211), the descriptive method is "the method in which all members of the research population or a large sample of it are surveyed with the aim of describing the target phenomenon in terms of its nature and frequency without attempting to explore relationships or identify causes." It is the most appropriate method for the current study because through it, the researchers can construct a realistic and authentic description of the phenomenon, analyze the results, and draw conclusions in light of the current reality.

Research population and sample

The population of the current study consists of all intellectual disability teachers in the city of Taif (n = 406) based on statistics from the Special Education Department for the second semester of the year 2022.

A random sample of 140 teachers of students with intellectual disabilities in Taif City was selected to represent the study population. Table 1 shows the characteristics of the sample in terms of gender, qualification, experience, and training courses.

Table 1.
Distribution of the participants according to study variables.

Gender			Qualification			Years of Experience			Training courses		
Type	Number	Percentage	Qualification	Number	Percentage	Experience	Number	Percentage	Courses	Number	Percentage
Male	98	%70	Bachelor's	104	%74.29	1-5 years	28	%20.00	5 courses or less	30	%21.43
Femal	42	%30	Master's	32	%22.86	6-10 years	30	%21.43	6-10 courses	28	%20.00
			PhD	4	%2.86	11 years and over	82	%58.57	11 courses or more	82	%58.57

Source: (Own authorship)

The research instrument

The required data was collected via a questionnaire developed in the light of previous literature. It aimed to identify the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from their teachers' perspectives, while also revealing the effect the variables of gender, qualification, experience, and training courses had on the identified factors. The literature related to the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities was reviewed and employed in the construction of the questionnaire. In its preliminary version, the questionnaire had two parts. The first part collected data on the demographics of the participants, namely gender (male and female), academic qualification (bachelor, master, and PhD), experience (1-5 years, 6-10 years, and 11 years or more), and training courses (5 courses or less, 6-10 courses, and 11 courses or more). The second part had 24 items dealing with the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from teachers' perspectives. The 24 items comprised three main dimensions: factors related to parents (11 items), factors related to teachers (8 items), and factors related to the educational institution (5 items).

The questionnaire's validity

The questionnaire content was validated by six referees specialized in special education. They were invited to judge the wording and clarity of items, their relevance to the measured construct, and their inclusion under their respective dimensions. Based on their feedback, some items were re-worded and two items were linguistically corrected. The content validated questionnaire was then written in Google Forms and electronically administered to a pilot sample of teachers of students with intellectual disabilities (n = 20). The questionnaire's internal consistency was then established by calculating correlations among items, total scores of their respective dimensions, correlations among dimensions and the questionnaire's total score. The correlation results are presented in table 2.

Table 2.
Pearson correlation coefficients among items and their respective dimensions

	The first dimension	The second dimension	The Third dimension
1	**0.684	**0.604	**0.847
2	**0.883	**0.678	**0.596
3	**0.898	**0.577	**0.854
4	*0.448	**0.683	**0.798
5	**0.782	*0.537	**0.845
6	**0.825	*0.521	
7	**0.740	**0.688	
8	**0.936	**0.851	
9		*0.479	
10		**0.624	
		*0.497	

**Significant at the 0.01 level, *Significant at the 0.05 level
Source: (Own authorship).

It is clear from table 3 that correlations among items and their dimensions are significant (p = 0.01, 0.05), indicating that the questionnaire is internally consistent.

Table 3.
Pearson correlation coefficients among dimensions and the questionnaire's total score

Dimension	Cor. with the total score
Factors related to parents that contribute to the activation of parental participation in the IEP	0.937**
Factors related to teachers that contribute to the activation of parental participation in the IEP	0.902**
Factors related to the educational institution that contribute to the activation of parental participation in the IEP	0.905**

**Significant at the 0.01 level, *Significant at the 0.05 level
Source: (Own authorship)

The questionnaire's reliability

The reliability of the questionnaire was established by using the split-half method and Cronbach's Alpha.

Table 4 shows the reliability coefficients for each dimension of the questionnaire.

Table 4.
Reliability coefficients of the questionnaire and its dimensions.

Dimension	Split-half	Coefficient **α**
Factors related to parents that contribute to the activation of parental participation in the IEP	0.755	0.825
Factors related to teachers that contribute to the activation of parental participation in the IEP	0.846	0.904
Factors related to the educational institution that contribute to the activation of parental participation in the IEP	0.825	0.849
Total	0.923	0.897

It is clear from table 4 that the reliability coefficients are acceptable, indicating that the questionnaire is reliable enough to be used for data collection in the present study. The reliability coefficients of the questionnaire's dimensions are high.

The final version of the questionnaire

The final version of the validated questionnaire had two parts. The first part included a description of the questionnaire, completion instructions, and the participants' demographic information. The second part had 24 items distributed under three dimensions, as shown in table 5.

Table 5.
The questionnaire's dimensions and items

Dimension	Number of items
Factors related to parents that contribute to the activation of parental participation in the IEP	**11**
Factors related to teachers that contribute to the activation of parental participation in the IEP	**8**
Factors related to the educational institution that contribute to the activation of parental participation in the IEP	**5**
Total of items	**24**

Source: (Own authorship)

Results and discussion

Factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from their teachers' perspectives.

To identify the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities from their teachers' perspectives, frequencies, percentages, means, and standard deviations were used. These results are shown in table 6.

Table 6.
The descriptive statistics of the participants' responses to the questionnaire.

No.	Item	No. & %	SD	D	N	A	SA	M	SDs	%	Rank
	Factors related to the parents themselves that contribute to activating their participation in the IEP										
1	I encourage parents to participate in planning IEP	No.	0	0	4	34	102	4.70	0.52	94	1
		%	0	0	2.86	24.29	72.86				
2	I explain to parents the importance of their cooperation with the school administration and teachers regarding the IEP	No.	0	0	0	42	98	4.70	0.46	94	2
		%	0	0	0	30	70				
3	I encourage parents to attend courses or seminars offered at the school on IEPs	No.	0	2	6	46	86	4.54	0.65	90.8	6
		%	0	1.43	4.29	32.86	61.43				
4	I make sure to keep parents informed of the instructional strategies used in the IEP	No.	0	2	8	52	78	4.47	0.67	89.4	8
		%	0	1.43	5.71	37.14	55.71				
5	I encouraging parents to monitor their children's academic progress in the IEP	No.	0	0	6	40	94	4.63	0.57	92.57	3
		%	0	0	4.29	28.57	67.14				
6	I conduct direct meetings with parents of students with IDs	No.	0	0	10	64	66	4.40	0.62	88	9
		%	0	0	7.14	45.71	47.14				
7	I set aside a specific time to contact parents to discuss their children's academic performance	No.	0	2	22	48	68	4.30	0.78	86.00	11
		%	0	1.43	15.71	34.29	48.57				
8	I allocate a specific time to contact parents to discuss points related to their children's' behavior	No.	0	4	16	44	76	4.37	0.80	87.43	10
		%	0	2.86	11.43	31.43	54.29				
9	It is easier for parents to participate in preparing the IEP through remote communication if they are unable to be present at school.	No.	0	4	8	40	88	4.51	0.73	90.29	7
		%	0	2.86	5.71	28.57	62.86				
10	It is easier for parents to follow up on any scientific or behavioral observations about their children on an ongoing basis	No.	0	0	4	46	90	4.61	0.54	92.29	4
		%	0	0	2.86	32.86	64.29				
11	I ensure that parents participate in identifying their children's strengths and needs in the IEP	No.	0	2	4	44	90	4.59	0.62	91.71	5
		%	0	1.43	2.86	31.43	64.29				
	Total	No.	0	16	88	500	936	4.53	0.63	90.60	
		%	0	1.04	5.71	32.47	60.78				
	Factors related to the teachers that contribute to the activation of parental participation in the IEP										
1	I make sure to communicate with parents early to program a suitable time to discuss the IEP	No.	0	0	8	54	78	4.50	0.61	90.00	3
		%	0	0	5.71	38.57	55.71				
2	I make sure to involve parents within the work team to plan their children's IEP	No.	2	4	14	52	68	4.29	0.87	85.71	7
		%	1.43	2.86	10.00	37.14	48.57				
3		No.	2	2	10	60	66	4.33	0.79	86.57	6

	I make sure to involve parents in the work team to implement their children's IEP	%	1.43	1.43	7.14	42.86	47.14				
4	I make sure to involve parents in the work team to evaluate their children's IEP	No.	0	4	16	62	58	4.24	0.77	84.86	8
		%	0	2.86	11.43	44.29	41.43				
5	I make sure to clarify the roles required of the parent as a member of the work team	No.	0	0	8	62	70	4.44	0.60	88.86	5
		%	0	0	5.71	44.29	50.00				
6	I make sure to use electronic applications to ensure parental participation in the IEP	No.	2	0	8	52	78	4.46	0.73	89.14	4
		%	1.43	0	5.71	37.14	55.71				
7	I make sure to reinforce parents when they participate in the IEP	No.	0	2	6	50	82	4.51	0.65	90.29	1
		%	0	4.29	35.71	58.57					
8	I make sure to provide clear activities for people with intellectual disabilities in which parents participate	No.	0	4	2	54	80	4.50	0.67	90.00	2
		%	0	2.86	1.43	38.57	57.14				
	Total	No.	6	16	72	446	580	4.41	88.18	0.71	
		%	0.54	1.43	6.43	39.82	51.79				
	Factors related to the educational institution that contribute to the activation of parental participation in the IEP										
1	The school administration provides means to introduce the importance of parental participation in the IEP	No.	0	6	4	56	74	4.41	0.75	88.29	2
		%	0	4.29	2.86	40.00	52.86				
2	The school administration provides designated places for holding parent-teacher councils	No.	0	4	4	58	74	4.44	0.69	88.86	1
		%	0	2.86	2.86	41.43	52.86				
3	The school administration provides all communication tools in the places designated for parent-teacher councils	No.	0	4	8	60	68	4.37	0.72	87.43	3
		%	0	2.86	5.71	42.86	48.57				
4	The school administration provides courses and seminars for parents on the IEP	No.	6	2	10	50	72	4.29	0.98	85.71	4
		%	4.29	1.43	7.14	35.71	51.43				
5	The school administration is keen to choose evening times that are suitable for working parents to meet with teachers	No.	6	16	32	38	48	3.76	1.17	75.14	5
		%	4.29	11.43	22.86	27.14	34.29				
	Total	No.	12	32	58	262	336	4.25	0.86	85.09	
		%	1.71	4.57	8.29	37.43	48.00				

Note: SD = strongly disagree, D = disagree, N = neutral, A = agree, SA = strongly agree, SDs = standard deviations
Source: (Own authorship)

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Table 6 illustrates the factors contributing to the activation of parental participation in the IEP. Regarding the first factor, the results in table 6 show that the number of the “Strongly Agree” responses was 936, with a frequency of 60.78%. The number of the “Agree” responses was 500, i.e., a frequency of 32.47%. This means that the majority of the sample agreed on the total factor. The general mean of this factor was 4.53, which suggests very strong agreement by the participants. The standard deviation of this factor was 0.63, indicating homogeneity in the participants’ responses to this factor. The results of the second factor indicated that the number of “Strongly Agree” responses was 580, which generates a frequency of 51.79%. The number of “Agree” responses was 446, with a frequency of 39.82%. Therefore, the majority of the sample agreed on the total factor. The general mean of this factor was 4.41, which reveals very strong agreement on the part of the study sample. The standard deviation of the sample’s responses reached 0.71, indicating homogeneity in the participants’ responses to this factor.

Regarding the third factor, the number of the “Strongly Agree” responses was 336, with a frequency of 48.00%, and the number of the “Agree” responses was at 262, with a frequency of 37.43%. This shows that the majority of the sample agreed on the total factor. The general mean of the factor was 4.25, indicating that the participants strongly agreed. The standard deviation of the sample’s responses to this factor was 0.86, revealing homogeneity in the participants’ responses. It is clear from the results that the participating teachers strongly agreed to a number of factors contributing to the activation of parental participation in the IEP. These factors are classified into three categories: factors related to parents, factors related to teachers, and factors related to the educational institution. These results emulate previous results. For instance, Al-Dosari and Al-Hano (2018) affirmed the importance of parental participation in the IEP for students with intellectual disabilities. They concluded that parental participation in the development of the IEPs for their children achieves the desired goals of those programs. Abunayyan (2015) found that educational supervisors are aware of the necessary aspects to activate parental participation in the IEP. Al-Ayed (2010) concluded that the services provided to students with learning difficulties were satisfactory to parents, which enhancing their contribution to their children’s learning.

A possible explanation for the high agreement of the participating teachers to the questionnaire’s factors is that parents of students with intellectual disabilities have a great interest and awareness of the importance of educating and rehabilitating their children, so they are highly motivated to participate effectively in their children’s IEPs. Parents of students with intellectual disabilities participated effectively in parent/ teacher meetings and, therefore, were updated on individual plans developed for their children. Teachers are also fully aware of the importance of parental participation in developing the IEPs. Also, the increasing cooperation between schools and families fosters effective communication between teachers and parents. Differences in the participants’ responses to the factors contributing to the activation of parental participation in the IEP for students with intellectual disabilities by gender, qualification, experience, and training courses.

To identify if there were statistically significant differences in teachers’ views regarding the factors contributing to the activation of parental participation in the IEP by gender, qualification, experience, and training courses, the t-test for independent samples and the ANOVA test were used.

Differences by gender

No statistically significant gender differences were found in the teachers’ views concerning the factors contributing to the activation of parental participation in the IEP. Table 7 shows these results.

Table 7.
The t-test for the gender differences in the teachers’ responses to the questionnaire.

Factor		N	M	SD	t-value	df	Sig.
Factors related to parents that contribute to the activation of their participation in their children’s IEP	Males	98	49.67	5.04	0.598-	138	0.551
	Females	42	50.19	3.74			
Factors related to teachers that contribute to the	Males	98	35.22	4.74	-0.197	138	0.844
	Females	42	35.38	3.07			

activation of parental participation in the IEP							
Factors related to the educational institution that contribute to the activation of parental participation in the IEP	Males	98	21.02	3.47	-1.417	138	0.159
	Females	42	21.86	2.47			
Total	Males	98	105.92	12.00	-0.746	138	0.457
	Females	42	107.43	8.08			

Source: (Own authorship)

Lack of gender differences in the teachers' views concerning the factors contributing to the activation of parental participation in their children's IEP reveals that both male and female teachers concur on the factors. This finding is in line with the study of Al-Ghasawneh (2007) which found no statistically significant ($\alpha \geq 05.0$) gender differences in the evaluation of the programs offered in special education classes in general schools in Taif from the teachers' perspectives. On the other hand, this finding is inconsistent with the study by Al-Zahrani & Al-Zahrani (2020) which aimed to identify the obstacles to implementing the individual educational plans for students with learning difficulties in the primary school in Jeddah from their teachers' perspectives, as well as to identify the effect of gender, qualification, and experience on the teachers' ratings. The results revealed statistically significant differences in teachers' ratings of the obstacles in favor of male teachers.

Differences by qualification

One way analysis of variance was calculated to determine if there were statistically significant differences in teachers' views concerning the factors contributing to the activation of parental participation in the students' IEPs by qualification. These results are presented in tables 8 and 9.

Table 8.
The teachers' responses to the questionnaire by qualification

Factor		N	M	SD
Factors related to parents that contribute to the activation of their participation in their children's IEPs	Bachelor	104	49.77	4.53
	MA	32	49.44	5.19
	PhD	4	54.50	0.58
	Total	140	49.83	4.68
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	Bachelor	104	34.92	4.30
	MA	32	35.81	4.21
	PhD	4	40.00	0.00
	Total	140	35.27	4.30
Factors related to the educational institution that contribute to the activation of parental participation in children's IEPs	Bachelor	104	21.31	2.83
	MA	32	20.69	4.20
	PhD	4	25.00	0.00
	Total	140	21.27	3.21
The Total Questionnaire	Bachelor	104	106.00	10.41
	MA	32	105.94	12.49
	PhD	4	119.50	0.58
	Total	140	106.37	10.96

Table 9.
The ANOVA test for differences in the teachers' views concerning the factors contributing to the activation of parental participation in the IEP by qualification.

Factors	Sum of squares		Df	Mean squares	f-value	Sig.
Factors related to parents that contribute to the activation of their participation in their children's IEPs	Between groups	92.55	2	46.27	2.15	0.121
	Within groups	2951.34	137	21.54		
	Total	3043.89	139			
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	Between groups	111.43	2	55.71	3.11	0.048
	Within groups	2456.26	137	17.93		
	Total	2567.69	139			
Factors related to the educational institution that contribute to the activation of parental participation in the IEPs	Between groups	66.66	2	33.33	3.34	0.039
	Within groups	1369.03	137	9.99		
	Total	1435.69	139			
The total questionnaire	Between groups	709.81	2	354.91	3.04	0.051
	Within groups	15994.88	137	116.75		
	Total	16704.69	139			

Source: (Own authorship)

From table 9, it is clear that the means of PhD holders were higher than those of bachelor and MA holders. It is also clear that there were statistically significant differences (p = 0.05) in the second factor, i.e., factors related to teachers, where the f-value was 3.11 at a significance level of 0.048. Furthermore, there were statistically significant differences in the third dimension, i.e., factors related to the educational institution where the f-value was 3.34 at a significance level of 0.039. The results also indicated that there were no statistically significant differences (p = 0.05) in the first dimension, i.e., factors related to the parents. Also, no statistically significant (p = 0.05) differences were found in the questionnaire as a whole.

To determine the direction of differences in the second and third factors, the LSD test was used. These results are shown in table 10.

Table 10.
The LSD test for differences in teachers' views concerning the second and the third factors by qualification.

	Variables		Mean difference	Sig.
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	BC	MA	0.88942-	0.301
		PhD	*5.07692-	0.020
	MA	BC	0.88942	0.301
		PhD	4.18750-	0.064
	PhD	BC	*5.07692	0.020
		MA	4.18750	0.064
Factors related to the educational institution that contribute to the activation of parental participation in the IEPs	BC	MA	0.62019	0.333
		PhD	*3.69231-	0.023
	MA	BC	0.62019-	0.333
		PhD	*4.31250-	0.011
	PhD	BC	*3.69231	0.023
		MA	*4.31250	0.011

Source: (Own authorship)

As shown in table 10, differences in the second dimension (factors related to teachers) were in favor of PhD holders. The difference between the means of the PhD and bachelor holders was 5.07692, which is statistically significant (p = 0.020). Similarly, differences in the third dimension (factors related to the educational institution) were in favor of PhD holders. The difference between the means of the PhD and bachelor holders was 3.69231, which is statistically significant (p = 0.020).

This study's finding of lack of statistically significant differences in the factors related to parents that contribute to the activation of their participation in their children's IEPs by qualification is in line with the study of Al-Ayed (2010) which did not find any significant differences in the level of parents' satisfaction with the services provided by the resource rooms for their children with learning difficulties. However, it conflicted with the study by Al-Zahrani and Al-Zahrani (2020), which found no statistically significant differences in teachers' views regarding the obstacles to applying the individual educational plan for elementary school students with learning difficulties by qualification. Al-Otaibi (2009) found a general satisfaction, although not high, with the services provided to students with special needs in special education institutes and programs. Contrary to the results of the current study, satisfaction clearly varied according to the educational level of the parents.

This study's finding that there were statistically significant differences in the factors related to the teacher and the educational institution that contribute to the activation of parental participation in their children's IEPs in favor of PhD holders did not concur with the study of Al-Ghasawneh (2007) which found no statistically significant differences in teachers' evaluation of the programs offered in special education classes in general schools in Taif by qualification. Likewise, the study of Al-Rashidi and Al-Najjar (2015) contradicted the current study in that it reported no statistically significant differences in teachers' assessment of the efficiency and obstacles to planning and implementing the IEP by the educational status.

Differences by experience

To identify if there were statistically significant differences in the teachers' views concerning the factors contributing to the activation of parental participation in the IEP by experience, the ANOVA test was used. These results are shown in tables 11 and 12.

Table 11.
The descriptive statistics of the teachers' responses to the questionnaire by experience.

Factor	Experience	N	M	SD
Factors related to parents that contribute to the activation of their participation in their children's IEPs	1-5 years	28	49.929	4.154
	6-10 years	30	50.733	4.975
	≥ 11 years	82	49.463	4.746
	Total	140	49.829	4.680
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	1-5 years	28	35.714	2.623
	6-10 years	30	36.467	3.521
	≥ 11 years	82	34.683	4.901
	Total	140	35.271	4.298
Factors related to the educational institution that contribute to the activation of parental participation in children's IEPs	1-5 years	28	21.857	2.138
	6-10 years	30	22.267	2.532
	≥ 11 years	82	20.707	3.619
	Total	140	21.271	3.214
The Total Questionnaire	1-5 years	28	107.500	7.361
	6-10 years	30	109.467	10.122
	≥ 11 years	82	104.854	12.048
	Total	140	106.371	10.963

Table 12.
The ANOVA test for differences in the teachers' views concerning the factors contributing to the activation of parental participation in the IEP by experience.

Factors	Sum of squares		df	Mean squares	f-value	Sig.
Factors related to parents that contribute to the activation of their participation in their children's IEPs	**Between groups**	35.77	2	17.89	0.815	0.445
	Within groups	3008.11	137	21.96		
	Total	3043.89	139			
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	**Between groups**	76.75	2	38.37	2.111	0.125
	Within groups	2490.94	137	18.18		
	Total	2567.69	139			
Factors related to the educational institution that contribute to the activation of parental participation in the IEPs	**Between groups**	65.41	2	32.71	3.270	0.041
	Within groups	1370.27	137	10.00		
	Total	1435.69	139			
The total questionnaire	**Between groups**	511.98	2	255.99	2.166	0.119
	Within groups	1619271.	137	118.19		
	Total	1670469.	139			

Source: (Own authorship)

From the data in table 11, it is clear that the mean score of the teachers with 6-10 years of experience was higher than the mean scores of teachers with 1-5 years of experience and of 11 years or more in the third dimension (factors related to the educational institution). The difference was statistically significant ($F = 3.72$, $p = 0.41$).

The results revealed no statistically significant differences ($p = 0.05$) in the first dimension (factors related to the parents) and the second dimension (factors related to the teacher) by experience. Similarly, no statistically significant differences were found for the questionnaire as a whole.

To determine the direction of differences for the third dimension, the LSD test was used, and the results were as shown in the following table.

The results of the LSD test in table 13 indicate that the differences in the third dimension (factors related to the educational institution) were in favor of teachers with 6-10 years of experience. The difference between the means of teachers with 6-10 years of experience and those with 11 or more years of experience was 1.55935. It was statistically significant ($p = 0.022$) in favor of teachers with experience from 6-10 years.

Table 13.
The LSD test for differences in teachers' views concerning the second and the third factors by experience.

	Variables	Mean difference		Sig.
Factors related to the educational institution that contribute to the activation of parental participation in the IEPs	1-5 years	1-5 years	-1.56	0.073
		6-10 years	-0.41	0.623
		≥ 11 years	1.15	0.099
	6-10 years	1-5 years	0.41	0.623
		≥ 11 years	*1.55935	0.022
	≥ 11 years	1-5 years	-1.15	0.099
		6-10 years	*-1.55935	0.022

Source: (Own authorship)

The lack of differences in the factors related to parents and teachers by experience concurred with the study of Al-Zahrani and Al-Zahrani (2020) that aimed to identify the obstacles to implementing the individual educational plans for students with learning difficulties in the primary school in Jeddah Governorate from their teachers' perspectives, as well as to identify the effect of gender, qualification, and experience on the teachers' ratings. The results revealed no statistically significant differences in teachers' ratings of the obstacles by experience. The result of the current study also concurred with the study of Al-Rashidi and Al-Najjar (2015) where no statistically significant differences were found in the teachers' assessment of the efficiency and the obstacles to planning and implementing the IEP by experience.

Differences by training courses

To determine if there were statistically significant differences in the teachers' views concerning the factors contributing to the activation of parental participation in the IEP by the number of training courses, the ANOVA test was used. These results are presented in table 14 and 15.

Table 14.
The descriptive statistics of the teachers' responses to the questionnaire by training.

Factor	No. of courses	N	M	SD
Factors related to parents that contribute to the activation of their participation in their children's IEPs	≤ 5 courses	30	48.87	5.79
	6-10 courses	28	51.36	3.30
	≥ 11 courses	82	49.66	4.56
	Total	140	49.83	4.68
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	≤ 5 courses	30	34.87	4.50
	6-10 courses	28	35.79	3.47
	≥ 11 courses	82	35.24	4.50
	Total	140	35.27	4.30
Factors related to the educational institution that contribute to the activation of parental participation in children's IEPs	≤ 5 courses	30	20.80	2.93
	6-10 courses	28	22.43	1.99
	≥ 11 courses	82	21.05	3.57
	Total	140	21.27	3.21
The Total Questionnaire	≤ 5 courses	30	104.53	11.48
	6-10 courses	28	109.57	7.22
	≥ 11 courses	82	105.95	11.69
	Total	140	106.37	10.96

Source: (Own authorship)

Table 15.
The ANOVA test for differences in the teachers' views concerning the factors contributing to the activation of parental participation in the IEP by training

Factors	Sum of squares	df		Mean squares	f-value	Sig.
Factors related to parents that contribute to the activation of their participation in their children's IEPs	Between groups	95.551	2	47.776	2.220	0.113
	Within groups	2948.334	137	21.521		
	Total	3043.886	139			
Factors related to teachers that contribute to the activation of parental participation in children's IEPs	Between groups	12.383	2	6.191	0.332	0.718
	Within groups	2555.303	137	18.652		
	Total	2567.686	139			
Factors related to the educational institution that contribute to the activation of parental participation in the IEPs	Between groups	48.224	2	24.112	2.381	0.096
	Within groups	1387.462	137	10.127		
	Total	1435.686	139			
The total questionnaire	Between groups	402.557	2	201.279	1.692	0.188
	Within groups	16302.129	137	118.994		
	Total	16704.686	139			

Source: (Own authorship)

As listed in table 15, there were no statistically significant differences ($p = 0.05$) in the dimensions of the questionnaire and in the questionnaire as a whole. That is, the number of training courses did not affect teachers' views regarding the factors contributing to the activation of parental participation in the IEP.

The results could be attributed to teachers' awareness of the importance of parental participation and the importance of communicating with them regarding the IEP for students with intellectual disabilities. Teachers who had attained PhDs proved to be more aware of the importance of the role of the teacher and the educational institution in getting parents to contribute to IEPs. Those teachers with PhDs also seemed more familiar with scientific research that emphasizes the need for the teacher to be a link between school and families, and that educational institutions serving students with intellectual disabilities should keep communicating with families in order to achieve the goals of IEPs for students with intellectual disabilities.

Teachers with 6-10 years of experience seemed to spend much more time and be more involved in the education of students with intellectual disabilities compared with other teachers, They seemed to be more aware of the importance and role of the educational institution in getting parents to contribute to the IEP. The number of training courses teachers participated in did not affect teachers' views on the factors contributing to the activation of parental participation in the IEP. It seems that teachers' views on the factors are similar regardless of whether they have extra training. It is worth noting that the researchers could not find a previous study addressing the effect of scientific courses on increasing the participation of parents in preparing and implementing the IEP for their children.

Conclusions

The results of the study revealed factors that contribute to the activation of parental participation in the IEP. These factors are classified into three types: factors related to parents, factors related to the teacher, and factors related to the educational institution. This study highlighted the importance of teacher awareness regarding the benefits of parental participation in their children's IEPs. No differences were found between male and female teachers regarding the factors contributing to the activation of parental participation in the IEP. Conversely, significant differences were found by qualification. Teachers who had attained PhDs proved to be more aware of the factors contributing to the activation of parental participation in the IEP.

In light of the results, the researchers recommend placing considerable attention to activating the participation of parents in the IEPs for students with intellectual disabilities. Parents should participate in planning, implementing, and evaluating the IEPs. Educational institutions serving students with disabilities should strengthen their communication with families, by encouraging parents to visit schools and cooperate with them to help achieve the goals of the IEPs. There should be continuous dialogue between the school and parents. Institutions should inform parents of the challenges regarding the education of students with intellectual disabilities. Parents should get involved in schools' advisory committees. The researchers could not find previous studies confirming or negating the effect of the number of training courses on teachers' views on the factors contributing to the activation of parental participation in the IEP, so the researchers suggest conducting more studies on the importance of the academic attainment of parents and teachers in activating parental participation in implementing the IEP.

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The new political marketing, or ideology of buen vivir

El nuevo marketing político o ideología del buen vivir

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Abstract

The present investigation constitutes a review and reflection of the new behaviors of political organization and alternative laws that are developing in South American countries, in which we expose various perspectives from which we carry out the theoretical description of old and new concepts, socio-historical and culture-politics. Concerning the theories and ideas built to interpret them, these force us to focus our gaze on those institutions, discourses, strategies, and procedures that were traditionally part of the understanding of what politics and law were. This relation is why, in the face of disenchantment or loss of faith in politics, in our opinion, explanations cannot continue to be constructed that insist on the distances between rulers and the governed, on the crisis of institutions, or the triumph of individualism, in the current era.
Therefore, it is necessary to reflect on how technological advancement can lead to a false premise about the ease of political marketing and the impact it has had in Ecuador in recent years, including the application of technology and the

Resumen

La presente investigación, constituye una revisión y reflexión de las nuevas conductas de organización política y del derecho alternativo que se van desarrollando en países sudamericanos, en la cual exponemos diversas perspectivas desde las que realizamos la descripción teórica de antiguos y nuevos conceptos, socio histórica y cultura-política. En relación con las teorías y conceptos construidos para interpretarlas; esto nos obliga a enfocar la mirada de aquellas instituciones, discursos, estrategias y procedimientos que tradicionalmente hicieron parte de la comprensión de lo que era la política y el derecho. Es por ello por lo que, frente al desencanto o pérdida de fe en lo político, a nuestro juicio, no se pueden seguir construyendo explicaciones que insistan en las distancias entre gobernantes y gobernados, en la crisis de las instituciones o en el triunfo del individualismo en la época actual.
Por tanto, es menester reflexionar sobre cómo el avance tecnológico puede conducir a una falsa premisa sobre la facilidad que posee el marketing político y el impacto que ha tenido en el Ecuador durante los últimos años; considerando inclusive la aplicación de la tecnología y el diseño de la

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design of propaganda as a resource to reach the population and position itself as a political brand.

Keywords: Political marketing, buen vivir, XXI century, politics, democracy.

propaganda como recurso para llegar a la población y posicionarse como una marca política.

Palabras clave: Marketing político, buen vivir, siglo XXI, política, democracia.

Introduction

The present investigation constitutes a review and reflection of the new behaviors of political organization and alternative laws that are developing in South American countries, in which we expose various perspectives from which we carry out the theoretical description of old and new concepts, socio-historical and culture-politics and a new political trend, such as "21st Century Socialism" was and is. Concerning the theories and ideas built to interpret them, these force us to focus our gaze on those institutions, discourses, strategies, and procedures that were traditionally part of the understanding of what politics and law were. This relation is why, in the face of disenchantment or loss of faith in politics, in our opinion, explanations cannot continue to be constructed that insist on the distances between rulers and the governed, on the crisis of institutions, or the triumph of individualism, in the current era.

Therefore, it is necessary to reflect on how technological advancement can lead to a false premise about the ease of political marketing and the impact it has had in Ecuador in recent years, including the application of technology and the design of propaganda as a resource to reach the population and position itself as a political brand (Macas-Acosta et al., 2022; Ochoa-Rico et al., 2022; Salvador-Guerra et al., 2023).

Political marketing constitutes a fundamental part of current processes; it transforms and overcomes paradigms created over time to build tactics and strategies that meet goals and objectives that lead to business, work, and political success. Marketing must be balanced so that both parties have the benefit or gain as participants in the management.

In this way, electoral success has depended not only on introductory offers, such as the construction of homes and schools, but also on restoring and reforming political processes that did not allow the advancement or strengthening of the country. This introduction is how marketing is currently presented as one of the commercial communication activities many companies are dedicating the most significant investment, even above advertising investment in conventional media. Almond & Verba (2015) and Keman (2006) divide political support attitudes according to their association with the system, processes, and outcomes. At a systemic level, there would be those related to the political regime itself (legitimacy) and those that reflect the values and support of citizens for the institutions, for example, national pride, obedience and adherence to the law, and the preferred political system. Regarding processes, we are interested in attitudes that reflect the commitment of individuals to the decision-making process and their expectations regarding the performance and work of their representatives. Finally, attitudes related to results refer to evaluating the agencies and processes involved in the election and selection of public figures and their effectiveness in developing and executing public policies; this includes feelings about voting trust in political parties, among others. Dover (2009) and Norris (2011) conceptualize "political support" by distinguishing the differences between support for the political community, the regime, and the authorities in five dimensions that are distributed on a continuum that ranges from more diffuse support for the nation-state to a more specific one, to politicians in particular:

- Support for the political community refers to the level of attachment to the nation regardless of the political system.
- Support for the regime's principles related to the democratic ideal and democratic values among the population.
- Evaluation of the regime's performance, that is, the degree of satisfaction with the functioning of the political system.
- Support for the institutions of the democratic system (Government, parliament, justice system, state bureaucracy, political parties, police and military).
- Support for political actors is associated with the evaluation and trust generated by politicians and authorities.

In the case of Latin America, trust in the institutions of democracy represents one of the most relevant elements in social and political analysis, especially since the democratic transition of the 1980s. Political instability was a constant in the region during the last two decades of the 20th century and the first of the 21st. Proof of this is that of the 113 governments elected until 2010, only 15 could not fully complete their period (Becerra, 2013). On the other hand, at the end of the first decade of this century, numerous political and economic factors seemed to contribute to the formation of a promising regional scenario: a) the emergence of new movements and government experiences, b) the recognition of sectors of the population previously discriminated against; c) a greater concentration of power in the executive (presidential); d) general acceptance of the urgency of eradicating poverty and inequality; e) a general questioning of the Washington consensus; f) the emergence of a regional power with global influence; and g) recognition of the need for practical regional cooperation and integration schemes (OEA, 2010).

This article aims to analyze political marketing to influence positive law and its impact on the sociopolitical reality of the last ten years in Ecuador as a generator of a new political trend (21st Century Socialism).

Methodology

The research is qualitative, taking as reference a descriptive analysis of the analysis of political marketing in the use of new populist messages that cemented new forms of popular governments of the 21st century in Argentina-Venezuela-Bolivia-Ecuador and the method involves the structuring of a system of political-socioeconomic indicators of the area, which constitutes the source of information.

The second objective is specified in the sociopolitical effects and their types of behavior, produced by political marketing in the positive law of Ecuador, to verify the use of political discourse as a tool of the new way of governing 21st Century Socialism.

Concerning the use of political speech, in the context of the right to regulation of the media and the legal rules on freedom of expression, such as the political influence of the State that influences the behavior of millions of people, it will be possible to identify the use of political discourse and its sociopolitical effects, in 21st Century Socialism in Ecuador, which corresponds to what was stated in the objective of this research.

Once analyzed, what is the content of the right to regulation of the media and freedom of expression, from the legal-philosophical level, from the point of view of law, according to several authors?

It raised the objective, and a series of documentary reviews were used; the first was a review of classics on the object of study, and the second was in books specialized in politics, discursive communication, and law. Likewise, the third review was of scientific articles indexed in MIAR greater than 6, Scopus, and Web of Science. The keywords to search for documents were "New Political Marketing", "Buen Vivir," and "Political Marketing.

Results and discussion

As a result, four points that encompass the systemic analysis of the object to be treated and to meet the objective will be analyzed.

Political Marketing as a Tool of 21st Century Socialism

We will begin the theoretical journey on the topic under study, discussing marketing as the genesis of creating marketing in different areas for which political marketing can be defined as a discipline somewhat discredited and misunderstood in America. Latin, not only in the epistemic field but also by the political class itself, mainly that of the “old guard,” as well as by different social groups. For some, the term marketing has a note of manipulation, deception, or deceit or, at best, superficiality, form, packaging, or banality. For its part, the term politics, for many citizens, is also synonymous with lies, tricks, abuse, and even corruption or negativity.

Combining both terms shows that with the single name this scientific discipline has acquired, it acquires a double connotation with a sharp negative imprint. Hence, some of its critics have described it as “a cynical way of lying to people to gain or retain power.” Since its baptism and birth, this discipline has inherited a negative image or perception in specific social sectors, associating it with deception and lies.

In the same way as a science that Political Marketing is shown to be, its consideration is based on several methods, one of them Scientific. In recent decades, the scientific method has become the standard of behavior in everything related to technology and the population's daily activities.

In the context of transformations from neoliberal capitalism to a self-proclaimed progressive government, the historical dimension of the State is marked by acts of feminist protest, embodied belligerent struggles that seek to disrupt the sexual common sense of state hegemony (Calla, 2007). It is paradoxical that the language of rights, spread during the nineties of the neoliberal boom, loses ground precisely within the framework of 21st Century Socialism. There is, therefore, an inequality in the passage of history: on the one hand, feminists broaden the framework of their claim's horizons in the official public sphere, as well as in generalized common sense; on the other, the Executive power retreats to a nationalism of paternalistic estate inheritance, allowing itself to be guided by ultra-religious conservatism.

Caria & Domínguez Martín (2014) mentions that "ideology is an illusion of satisfaction of childhood desire, represented by the mother (as a symbol of liberation from need), in the face of the harsh reality, represented by the father (as a symbol of domination, sublimation, and resignation). False consciousness, which is the link between the two research programs (psychoanalysis), consists in the fact that reality stops being what it is and becomes what it should be, or rather, what we would like. That was. Finally, Marcuse (2013) will go one step further by stating that false consciousness (in capitalism) ends up becoming true consciousness through magical-ritual performative formulas, immune to contradiction and with a high authoritarian load: ideology, internalized to the complete alienation of Orwellian newspeak, it is thus constructed with tautological, dualistic definitions that pronounce condemnations of good/bad and right/wrong."

Since the beginning of the 21st century, social movements and organizations with diverse identities and structures began integrating into this new social and political fabric. Reincorporating the popular sectors into active political and economic life generated greater social inclusion in financial terms and positive social mobility.

However, this impact has favored not only the popular sectors but also social mobility, which, in turn, produced a significant expansion of the middle sectors that saw their options for social advancement multiplied (Acosta Espinosa, 2011).

The political discourse of socialism in the 21st century

It is a proposal that arises from practice rather than being the result of the reflection of one or several authorized left-wing intellectuals (Borón, 2008). In such a way, the Constitutions of the political processes came to power at the beginning of the 21st century. From this perspective, as García Linera (2015) points out, one of the main contributions of the Greek-French sociologist Nicos Poulantzas is to rethink the importance of the State as a space or field of condensation or processing of the relations of forces between different classes, within society.

For this reason, they are not only official or professional politicians but also politicians involved in politics. If speech controls minds and minds control action, for those in power, controlling speech is essential. Above all, discourse must be analyzed not only as an autonomous "verbal" object but also as a situated interaction, as a social practice, or as a type of communication that occurs in a social, cultural, historical, or political situation.

How those in power regulate access to expression must be closely examined, as is typically observed in the case of one of the most influential forms of public discourse: mass media. In all these cases, we are talking about active access, that is, participation in the control of the contents and forms of the media, and not about the more or less passive access of consumers (even when these consumers may actively resist the messages from the press adopting interpretations different from those that are intended to be imposed on them (Van Dijk, 2009). Political cognition is an indispensable theoretical interface between politics and political discourse's personal and collective dimensions (Van Dijk, 2009).

Therefore, we must observe that. "The study of political discourse should not be limited to the structural properties of the text or speech itself; "It also includes a systematic account of context and its relations to discursive structures." (Van Dijk & Rodrigo Mendizábal, 1999)

In this way and following Lakoff's principle, "The issues can be characterized by being polarized evaluations, which is functional and effective in the political process, and in the battle for hegemony, support, and popular legitimacy." The general strategic principle of all political and ideological discourse is the frame (a theory developed extensively and deeply by Lakoff), "which refers to the political-ideological frameworks that limit speech and the political text and its evaluation." (Lakoff & Johnson, 2020).

“The most determining thing in political discourse is the structures and strategies of argumentation, in which the political dispute over semantic macrostructures occurs. The meanings, in turn, reflect the political contexts, whose polarization will generally result in contrastive meanings” (Van Dijk & Rodrigo Mendizábal, 1999).

We can observe that the strategy of the speech will always be to convince, as is the case of the different speeches used by the candidacy led by Iglesias (Leader of PODEMOS), “who has not achieved millions of votes just for what he proposes, but above all for what he criticizes and for the skill with which he does it, the skill with which he articulates and issues his political discourse.” As Gómez Fernández (1995) points out, "politics becomes a field where the way of doing things is as important as what is done."

Following Laclau, “in its (Gramscian) adaptation to our time, this model indicates that in a context of social, political and economic crisis, taking into account the unsatisfied demands of all kinds proliferate, populism serves as a logic of articulation of discourse, as an instrument to dispute hegemony in political struggles, and this is the strategy used by both leaders and movements in their fight to conquer political power; through the construction of collective identities, the importance of “floating signifiers”, as well as “the construction of popular unity through the political channeling of majority social demands, that is, the need for a “social cement”. These “try to unite the heterogeneous elements – a unit that is not provided for by any functionalist or structuralist articulatory logic – giving centrality to the emotional aspect in the social constitution” (Laclau, 2005).

In the set of sustainable development discourses articulated by Latin American authors, one of the emerging discourses in the last five years is “Good living.” This discourse is part of the global discursive field of sustainable development since it considers the fundamental problem of sustainability (the relationship of mutual dependence between humanity and the environment) in a specific way. As we will see, as the installation of this new discourse in the regulatory landscape and certain sociopolitical practices is confirmed, its content diversifies. Thus, it became a sub-field in the global discursive field of sustainable development, a subcategory that includes a series of more or less analogous discourses constructed by the communities that have adopted and adapted it (Hidalgo-Capitán & Cubillo-Guevara, 2014; Cubillo-Guevara et al., 2014; Gudynas, 2011).

The discourses of Good Living appear in Latin America, favored by a unique historical situation. In the 1990s, faced with the neoliberal orientation of post-authoritarian governments, different sociopolitical movements emerged in several Latin American countries (Hidalgo-Capitán, 2012; Loera González, 2015).

Although these processes are very complex, and it would be necessary to clarify the situations in different countries, it is admitted that they marked a historical turn towards “progressive” or “post-neoliberal” policies (Yashar, 2005).

According to Eduardo Gudynas and Alberto Acosta, Good Living can be defined (very openly) as an “opportunity to build another society based on the coexistence of human beings in diversity and harmony with nature, based on the recognition of the various existing cultural values.” in each country and the world” (Gudynas & Acosta, 2011). As an alternative discourse to the dominant versions of development, it is the result of a particular combination between (1) certain ethical principles of the ancient Andean culture (defended by indigenous movements), (2) the contemporary contributions of some critical intellectuals and (3) the liminal incorporation of these principles in the political sphere, which is particularly visible in Ecuador and Bolivia, which included Good Living in their new constitutions.

Returning to García Linera in this reading on 21st Century socialism, we can say then that the popular struggles displayed their intensity within the State, modifying the relations of force, transforming the materiality of its legislation, altering the way of managing common goods and modifying the moral and logical schemes with which people organize their presence in the world.

In the regional context of an anti-imperialist post-neoliberal nationalism that seeks to expel foreign powers to regain control of its resources to promote national development, Ecuador raises the discourse of return to the great homeland. More than an ambiguity, the constitutional discourse points out the unresolved battle for constructing common sense, the naturalization of powers. That is where the disputes for hegemony lie. Liberal democracy is based not exclusively on capital accumulation but, inevitably, on the set of values and beliefs that make faith in the existence of the State possible, making it function. The State is, above all, a cultural construction crossed by a sentiment widely spread by religious schools. As such, it is based on a series of discourses of truth: documents, laws, enactments, proclamations, pronouncements, routines, rituals, and ceremonies that point to its sustainability (Lagos & Calla, 2007).

The new Latin American left zones of 21st-century socialism

The reflections of Pablo Stefanoni (2016) are highly significant and current. These considerations will allow us to draw a description and analysis of the South American experiences of 21st-century Socialism. In this sense, we will try to outline three fundamental points following the common thread of the author's thoughts: a) the character of pink leftists, b) the popular nationalism inserted in them, and c) some features of the leadership.

First, it should be noted that according to our author: "…in Latin America, a kind of new left emerged that, especially within the framework of the Bolivarian Alliance for Our America (ALBA), combined reformist practices with revolutionary discourse, in variable combinations". Who showed a great capacity to generate powerful political-social stories, but also faced a series of problems linked to the exercise of power that derived from that constitutive ambiguity - which is not new - between democracy and revolution" Stefanoni (2016).

Regarding the "pink" character in the experiences of South American socialism, it is pointed out that "…the expression pink tide, used in the United States to refer to the so-called regional 'turn to the left', has the advantage of synthesizing, with that discolored red, the tensions between the survival of discourse - and a will? -of radical change and the (realpolitik) with which its representatives served in power, from where they experienced the sensation of governing in a hostile world, in which state control is not enough to carry out the political and social changes that in other decades were perceived as closer, when the 'wind of history' had not yet dissipated and seemed to guarantee the arrival, sooner or later - and it was often added, 'sooner rather than later' - to a successful port; that is, to a more just world" Stefanoni (2016).

Stefanoni points out that "… the turn to the left could be associated with a consumer pact (internal market), an inclusion pact (social policies) and a sovereignty pact (independence from the United States, new international alignments) that, in various degrees, they dye all 'pink' experiences and established new common senses that condition conservative oppositions and force them to include, with or without faith, these topics in their agendas" Stefanoni (2016).

Referring to popular nationalism in the experiences analyzed, Stefanoni states that "if socialism ('of the 21st century') has returned to the agenda, it is thought of as a deepening of nationalism; a kind of posthumous triumph for the national left of Jorge Abelardo Ramos. Hence, the socialism of the 21st century is more of a state product than a socializing product and will take the form of left-wing populism" Stefanoni (2016).

He concludes: "It is not that there is no production of radical anti-systemic thought, even in a Marxist key, but that thought is increasingly cryptic, disconnected from political struggles and produced very far from the spaces where political and social actors are constituted" (Stefanoni 2016).

Considering Atilo Borón's definition, this author maintains that "whoever wants to talk about development today has to be willing to talk about socialism; and if you do not want to talk about socialism, you should remain silent when talking about economic development" (Borón, 2008). "It refers to the fact that the capitalist route to development is closed and that it is necessary to create a new one, given that within capitalism, there is no solution to the multiple problems of Latin America. Borón (2008) concludes that "If there is a solution – and if we have time to find a solution, given the threat of ecological holocaust that looms over the planet –we will have to look for it outside of capitalism, in the field of socialism." Thus, "from this observation this author proposes to develop a definition of the socialist horizon and he does so through a tripartite reflection: the modular values and principles, the project program and the historical subject of that project" (Borón, 2004).

"Modular values and principles. The first thing that must be affirmed in this regard is the unquestionable ethical superiority of socialism concerning capitalism. Indeed, socialism is a superior form of civilization, given the predominance of values such as altruism, solidarity, democracy, respect for nature, and appreciation of socio-diversity, among others. Then, it would have to be said that the axiological apparatus of 21st-century socialism is built on an affirmation and a denial: the first refers to overcoming the economistic vision. At the same time, the second relates to anti-values that should not be assumed. Regarding the abolition of economism, it is clear that the fundamental value is the person, and, in this sense, the economy must be at the service of the person and not the person at the service of the economy, as has happened until now with capitalism.

“This implies assuming two fundamental values: solidarity between people and respect for nature. Regarding the anti-values that should not be assumed, Lebowitz (2006), cited by Borón (2008), maintains that they are the following: statism, populism, totalitarianism, the idolatry of technology and, finally, resignation before the logic of capital”.

Although the values presented embody the socialist ideal and constitute the mobilizing utopia of socialism, the truth is that every ideology must have concrete supports that become historically and truly visible in a project of social transformation. If this were not the case, 21st-century socialism would risk being relegated to the realm of ideas stripped of all practical resonance. Thus, this project must assume at least two major programs. The first refers to economic planning that adjusts to Latin America's concrete and particular needs (especially to the circumstances of each country in its here and now). Nothing indicates that foreign models should be imitated. For example, today, nothing would justify a centralized scheme of direction and control of economic life and, much less, its complete nationalization, as occurred at the time in the Soviet Union, since this would favor the predominance of the bureaucracy and the consolidation of its interests. The second program refers to breaking the “single thought” that mythologizes socialism and conceives it as a monolithic, dogmatic, and static system applicable anywhere in the world and at any time in history.

On the contrary, today, a different socialism is needed, capable of reinventing itself, creating new realities, making new alliances, and breaking old schemes. In effect”, “Clinging to an old model, even if it has been successful in the past when the conditions that made it possible and reasonable have been extinguished, is equivalent to embarking on a path that inexorably culminates in a major and painful failure” (Borón, 2008). For this reason, Mariátegui states: “We certainly do not want socialism in America to be a carbon copy. It must be a heroic creation. We must give life to Indo-American socialism with our reality, in our language. Here is a mission worthy of a new generation” (1952).

Socialism of the Ecuadorian 21st century: Political marketing or ideology of Buen Vivir?

Political marketing tools effectively seek to modify electoral behavior, which requires two consecutive phases: notoriety and adhesion.

“The concept of good living has aroused much interest within and outside the borders of the Andean context in which it emerged.” (SENPLADES, 2013), following (Walsh, 2010), “is to unravel the interpretation and application of the paradigm of good living as a guiding principle of a (supposed) new regime” that “opens the door to formulate alternatives to development” (Acosta Espinosa, 2011) "beyond development" (Gudynas & Acosta, 2011) Considering that "the Government of the Citizen Revolution, collecting the approaches of the Andean-Amazonian peoples, raises the notion of good living as a central objective of public policy » (SENPLADES, 2013), “we will focus on analyzing how and to what extent the principles of good living are used as a reference in the construction and articulation of the different public policies of Ecuador.”

In the preamble of the Constitution of the Republic, the objective of the constituent National Assembly is set: to build "a new form of citizen coexistence, in diversity and harmony with nature, to achieve good living, the Sumak Kawsay" (Constitution of Ecuador, 2008). “Good living, also defined as “new social pact” or “new coexistence pact” (Ramírez Gallegos, 2010), “implies a comprehensive vision of the human being and integrates the material and spiritual aspects of well-being. It is identified with “life in its fullness” (Ramírez Gallegos, 2010) as balance and harmony between the different dimensions of the human being. Good living is "the need to live in harmony with nature, oneself and others, recognizing cultural diversity."

Considering this and taking the definition of Sousa (2014), “it is not necessary to resort to convoluted socio-anthropological-postcolonial analyses. Simply put, in a country characterized by high levels of inequality and exclusion, the policies of transferring resources to marginalized sectors and modernizing an old and inefficient institutional apparatus have had the effect of a revolution and have made it possible to compensate for the postponement and degradation of the other constitutive dimension of Good Living: the environmental one. The question is whether it was and is necessary to embellish and embellish a project of this nature with all the poetry of good living", that "vigorous spirit that drives learning and improvement" and "is present in love, in friendship, in fraternity, in solidarity and harmony with nature" (Senplades, 2013)

According to Dieterich (2006), “The historical moment to build and implement 21st-century socialism has already arrived since the bourgeois civilization on which the capitalist system is based is ending. This finding is based on scientific and ethical knowledge that demonstrates that the classic phase of the bourgeoisie, which began at the end of the Second World War and reached its most evolved configuration, marks, at the same time, its decline towards post-capitalist civilization. In particular, three pieces of evidence show this: 1. The structural exhaustion of the basic institutions of the bourgeois system; 2. the appearance of constitutive structures within the new post-bourgeois civilization in contemporary global society; and 3. the logic of the social evolution of humanity”.

Conclusions

The emergence of political marketing in Western democracies has turned them into another market for capitalism and the consumer society, transforming the citizen into a consumer and politicians and programs into products for sale. With this, the entire democracy has undergone a profound modification, some of whose features we have wanted to highlight. The professionalization of the political class, the reduction of parties to a power apparatus advised by a team of experts, and the predominance of personal ambition and self-interest as the origin of the political vocation.

In the political field, socioeconomic imbalances could further weaken the acceptance of the model, even by business sectors. Both private and public law, specifically, will be linked to the exploitation and hegemony of political marketing.

Marketing as a way of creating discourse in the mediatization of politics requires a specific adaptation of the political message, considering that the media act as a sounding board for political communication.

The bourgeoisie that dominated Latin America was responsible for generating new political trends, as events and circumstances have been presented that clearly show that capitalism, and more specifically neoliberalism, is an unsustainable and decadent system that must give way to a new reality: socialism of the 21st century.

The potential of Good Living lies in its ability to interact with these pre-existing cultural, sociopolitical, and economic arrangements and with the other discourses that have drawn the bifurcated paths of sustainable development for more than 40 years.

We can observe that these governments, with the political ideal of 21st Century Socialism in the region, present the severe problem of progressive and revolutionary governments concerning their ethical and moral reform. However, the return of Cristina Fernández de Kirchner to Argentina seems somewhat debatable.

The construction of our vision of the social world is the product of struggles for the imposition of a principle of vision and division - as Bourdieu maintains - in which the media space is fundamental. The cosmopolitanism derived from this economic, technological, and sociocultural situation is not exclusive to the dominant classes, and anthropology occupies a privileged position to explore how various groups incorporate a “global ecumene” and its effects on our political structures. and our democratizing project.

In politics, 21st Century Socialism has used the media's most powerful tools and the reach of solid, consistent discourse with great social acceptance.

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Factors influencing students' academic achievement: evidence from University of Ha'il Kingdom of Saudi Arabia

طلباء کی تعلیمی کامیابیوں کو متاثر کرنے والے عوامل: سعودی عرب کی جامعہ حائل کنگڈم سے شواہد

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Abstract

The current study's goal is to determine the effect of "student interest," "perceived self-efficacy," and "learning motivation" on undergraduate students' CGPA. The present investigation employed a quantitative methodology, utilizing a cross-sectional survey delivered through an online Google Form that participants self-administered. The current study's target demographic was undergraduate students at a public university. In this survey, 230 undergraduate students took part. The variable combination predicted approximately 39.6% of the overall variance in predicting the CGPA. The predicted regression model in the study was significant (F(3,226 = 50.960, p 0.001), and it discovered that other than "students' interest," only two factors significantly predicted the outcome variable CGPA. However, "student interest" has a positive but negligible effect on the CGPA. It is recommended that teachers use effective classroom strategies to assist students in raising their interest, learning motivation, and self-efficacy to accelerate their academic achievement.

Keywords: students' interest, self-efficacy, learning motivation, CGPA, undergraduate students, Ha'il University.

خلاصہ:

موجودہ مطالعہ کا ہدف انڈر گریجویٹ طلباء کے مجموعی گریڈ پوائنٹ اوسط پر "طلبہ کی دلچسپی"، "سمجھی ہوئی خود افادیت" اور "سیکھنے کی تحریک" کے اثر کا تعین کرنا ہے۔ موجودہ تحقیقات میں ایک مقداری طریقہ کار کا استعمال کیا گیا ہے، جس میں ایک آن لائن گوگل فارم کے ذریعے فراہم کردہ ایک کراس سیکشنل سروے کا استعمال کیا گیا ہے جس کا شرکاء خود انتظام کرتے ہیں۔ موجودہ مطالعہ کا ہدف آبادی ایک عوامی یونیورسٹی کے انڈرگریجویٹ طلباء تھے۔ اس سروے میں انڈرگریجویٹ سطح پر انگلش میجرز نے حصہ لیا۔ متغیر امتزاج نے "مجموعی گریڈ پوائنٹ اوسط" کی پیشن گوئی کرنے میں مجموعی تغیر کے 230 تقریباً 39.6% کی پیش گوئی کی۔ مطالعہ میں پیشن گوئی رجعت کا ماڈل اہم تھا (F(3,226 = 50.960, p 0.00) ، اور اس نے دریافت کیا کہ "طلبہ کی دلچسپی" کے علاوہ، صرف دو عوامل نے نتائج کے متغیر "مجموعی گریڈ پوائنٹ اوسط" کی نمایاں طور پر پیش گوئی کی۔ تاہم، " طلباء کی دلچسپی" کا "مجموعی گریڈ پوائنٹ اوسط" پر مثبت لیکن نہ ہونے کے برابر اثر پڑتا ہے۔ یہ سفارش کی جاتی ہے کہ اساتذہ طلباء کی دلچسپی بڑھانے، سیکھنے کی ترغیب اور خود افادیت کو بڑھانے کے لیے ان کی تعلیمی کامیابی کو تیز کرنے میں مدد کرنے کے لیے موثر کلاس روم کی حکمت عملی استعمال کریں۔

مطلوبہ الفاظ: طلباء کی دلچسپی؛ خود افادیت؛ سیکھنے کی حوصلہ افزائی؛ مجموعی گریڈ پوائنٹ اوسط؛ انڈر گریجویٹ طلباء؛ جامعة حائل

Introduction

Theoretical background

Until recently, the policy on education has not prioritized encouraging student learning as well as very precisely, how to stimulate and sustain their interest in learning (Renninger & Hidi, 2020). Besides, taking an interest in what one is doing improves comprehension (Hagay & Baram-Tsabari, 2011). The growth of interest correlates with the capacity to maintain focus,

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plan and achieve objectives efficiently, apply learning techniques to manage behavior, feel confident, and make innovative contributions (Hidi, 1995; McDaniel, et al., 2000; Harackiewicz et al., 2008; Bernacki & Walkington, 2018; Sansone et al., 2015; Lee, et al., 2014; Izard & Ackerman, 2000). Within the wider context of education, learners have a network or framework of particular interests, a few directly tied to instructional goals, and others hostile to classroom learning (Ainley et al., 2002). It has been extensively reported in the literature how researchers have reintroduced the idea of interest after years of neglect. (Hidi, 1990; Krapp, 1999; Krapp, et al., 1992). Furthermore, the opinions people have about their ability to perform at specific capacities and exercise power over situations that affect their lives are referred to as perceived self-efficacy (Bandura, 1994). Self-efficacy is still a useful term since studies have indicated that a substantial degree of self-efficacy is linked to an optimistic self-perception, the use of advanced learning techniques, success standards, and persistence in a task (Puzziferro, 2008; Wang & Wu, 2008). Moreover, self-efficacy is the conviction that one can plan and carry out the necessary actions to achieve a desired outcome (Bandura, 1997). An absence of self-efficacy is also linked to a poor perception of oneself, and an aversion to taking on new challenges (Hsieh et al., 2008). According to Demirtas (2010), achievement among learners is demonstrated by the actions, expertise, and abilities that all students develop in learning contexts. It is also reflected in their educational results (Demirtas, 2010). Numerous studies on students' academic achievement have been undertaken (e.g., Demirtas 2010; Flashman, 2012; Lindholm-Leary, & Borsato, 2006; Wang & Wu, 2008). Individual variations in learning capacity and willingness to learn have long been thought to be major antecedents of learning and training performance (Campbell, 1989; Goldstein, 1993; Noe, 1986; Noe & Schmitt, 1986).

Review of the related literature

Students' interest

It appears to have consistently shown that interest, a concept with both cognitive and emotional components, influences learning. It has been seen to impact students' self-control and focus (Ainley et al., 2002; & Hidi & Ainley, 2008). One definition of individual interest is a reasonably persistent inclination to pay attention to particular events and occurrences and get involved in particular pursuits (Krapp et al., 1992; Renninger, 1992; Renninger, 2000). The level of excellence of a person's involvement in projects, activities, and assignments is improved by interest growth. Students with minimal or no experience might not be required to choose their courses, as interest is necessary for them to reach a well-informed selection (Renninger & Hidi, 2020). Hidi and Renninger (2006) define the initial spark of interest as enabling interaction, which, if sustained, may continue to expand and expand as time passes. This is reflected in their four-phase model of interest building. According to Ainley (1998), having a broad interest in learning is a defining attitude to tackling unfamiliar, unclear, or perplexing phenomena to comprehend them. This kind of interest may entail simultaneously extending one's current understanding and acquiring new information.

Moreover, Ainley's (1998) research discovered, a variety of favorable views on education were linked to an individual's overall interest in learning and academic achievement. The following represent a few instances of techniques for piquing and sustaining attention that can take into account variations in learners' interest: i) providing current content to students by use of unique, unexpected, or challenging assignment aspects (Hidi & Baird, 1986; Nieswandt & Horowitz, 2015); ii) allowing students to collaborate directly on unrestricted assignments, capitalizing on their interest in the interpersonal aspects of collaborative tasks (Knogler, et al., 2015; Mitchell, 1993); iii) putting students' current interests within the context of texts as well as challenges to personalize the material (Bernacki & Walkington, 2018). Numerous studies on students' interest have been undertaken (Ainley, 1998; Ainley et al., 2002; Xu et al., 2012; Crouch et al., 2018; Rotgans & Schmidt, 2011).

Perceived self-efficacy

Perceptions of one's ability to plan and carry out the actions necessary to achieve certain goals are called self-efficacy (Bandura, 1997). Self-efficacy has a significant influence on students' academic achievement because students with poorer levels of self-efficacy find it harder to persevere through more demanding, tough assignments (Bandura, 1996; De Clercq et al., 2011; Richardson et al., 2012). In an unfavorable environment, students struggle with educational adjustment in university, which has a detrimental influence on their educational advancement (Bailey & Phillips, 2016; Pascarella & Terenzini, 2005). Self-efficacy refers to a person's views that are developed through their daily interactions. These beliefs impact the motivational, intellectual, and emotional reactions that people have when acquiring and growing (Bandura, 1996). Academic self-efficacy is essential to all aspects of a student's educational process, acting as a critical mediator in how learners act (Schunk & Mullen, 2012). Several research findings suggest that those with strong academic self-efficacy are more likely to exert significant effort when accomplishing academic assignments. On the other hand, individuals who have poor academic self-efficacy typically avoid taking on academic issues that they believe are beyond their reach (Britner & Pajares, 2006; Kiran & Sungur, 2012).

Learning motivation

Learning motivation is paying attention to and absorb the knowledge offered in a course of study for one's professional development (Noe, 1986). Likewise, it is well-recognized how people's learning motivation correlates to a variety of cognitive effects, notably, post-learning motivation, satisfaction as well as responses to instruction, and anxiousness (Colquitt et al., 2000). Cole et al. (2004) predict that the favorable association between class-specific motivation to acquire knowledge and emotional effects will be best if resilience is higher. Within such conditions, students are likely to have greater demands on themselves academically, partially because they are determined, feel effective, and view their current situation including their capacity to deal with it as less threatening. They go on to say that students who have been stimulated by educational difficulties are anticipated to stay driven, feel more cheerful rather than sad, and to respond positively towards their curriculum and teachers (Cole et al., 2004). Considering learning motivation seems changeable and may alter over a while (Noe, 1986), individuals' degree of learning motivation might fluctuate over a semester. Students' motivation for academic achievement may improve, diminish, or remain unchanged (Cole et al., 2004).

Previous studies and hypotheses development

Robbi et al. (2020) conducted a quantitative study on learning motivation on learning achievement in Indonesia with a sample of 224 students. Their study showed that students' success is significantly influenced by learning motivation. Similarly, Colquitt and Simmering (1998) performed a six-week longitudinal research on goal-setting and motivation to learn using 103 samples. They observed that diligence and 'learning orientation' were associated with motivation to learn before as well as following obtaining 'performance feedback', whereas 'performance orientation' was negatively associated with willingness to study equally before and following obtaining 'performance feedback'. The Investment Model Scale was established by Rusbult et al. (1998) to assess several factors that are important for comprehending how relationships function. With the process of measuring these variables, the scale gives an in-depth structure for assessing the stability and strength of interactions.

Feng (2013) studied on 109 Taiwanese undergraduate students. Their findings indicate that learning motivation is an important aspect of acquiring English as a foreign language, while there are a few differences between genders in students' learning motivations. Moreover, Huseinović (2024) evaluated the influence of gaming on student motivation and academic performance at higher education institutions. The study's findings show that gaming tactics have a substantial influence on students' motivation and also on how well they do in EFL classes and their academic achievement. In addition to the conventional behavioral, emotional, and cognitive dimensions, Reeve and Tseng (2011) investigate the idea of agency in students' participation in learning events and propose it as a fourth dimension. Their study investigates how agency, defined as students' active involvement in the learning process, influences overall engagement and academic achievement. Through empirical research and theoretical analysis, the authors assert that fostering agency is crucial for promoting deeper and more meaningful learning experiences.

Asvio et al. (2017) carried out a study to discover the effects of students' learning motivation on their academic accomplishment. They conducted this quantitative study on a sample of 129 students. Their findings showed that students' learning motivation had a significant favorable effect on their learning accomplishment. Zhao et al. (2022) investigated the impact of various learning tactics on learning motivation. Their study revealed that learning styles had a considerable influence on 'deep motivation'. Furthermore, Muthik et al. (2022) determined the impact of students' learning motivation on academic results utilizing the reciprocal teaching-learning framework. Their findings indicate that the use of reciprocal teaching-learning strategies can enhance student achievement by inspiring students to learn. Similarly, the association between middle school pupils' academic achievement and their self-efficacy attribution is examined by Kairong et al. (1999). Their study explores the relationship between students' self-perceptions and academic success. It is likely that the researchers looked at how students' self-perceptions of their skills affect their drive, work ethic, and academic performance.

Jiao et al. (2022) research looked into the learning motivation of Chinese ethnic backgrounds university students. This study included a sample of 776 undergraduates representing three ethnically represented universities. The research revealed four distinct forms of English learning motivation: "intrinsic interest", "learning situation", "personal development", and "international communication". Findings showed that learning context motivation had a considerably negative effect on English proficiency, but intrinsic interest motivation showed a significantly positive effect. Similarly, Munawaroh et al. (2022) conducted a study with 129 learners from Indonesia's Economics department. They sought to find out how Koschmann, Myers, and Barrows' (1993) e-PBL framework affected motivation among pupils, interest, and success. They verified their hypotheses using the path analysis approach. They discovered the e-PBL approach assists students in solving and exploring their analytical abilities while also piquing their interest in tackling problems with learning.

Renninger and Hidi (2020) suggested a four-stage model for student interest development. They discovered that transformation in each stage of interest growth by an action of activating that drives seeking information, growing knowledge, and fostering appreciation in students. Besides, Ainley et al. (2002) explored the role of computer tasks in mediating students' interest and learning. Researchers looked into whether personal context-specific elements influence subject interest in sentence learning. According to the study's findings, the most robust model relating subject interest and learning stated that subject interest was associated with a psychological reaction, the impact ultimately then linked to text persistence, and perseverance contributed to academic achievement. Wilkins et al. (2016) look at how dedicated students are to their studies, how well they perform academically, and how satisfied they are with their whole educational experience. Study results indicate that students' involvement and achievement in higher education are positively impacted by their sense of loyalty and belonging in both social and organizational environments.

Casanova et al. (2024) studied academic performance determinants in 447 undergraduate students. For demographic factors, the results reveal statistically significant pathways. Academic engagement and self-efficacy had a favorable, substantial, and statistically noteworthy correlation. A recent study conducted by Chen et al. (2023). They explored the associations between career personality, academic self-efficacy, and learning participation among students studying tourism. According to the findings, there is no substantial relationship between students' occupational cognitive abilities and educational involvement.

According to the previous evaluation of the literature, the bulk of research has explored the interests of learners, learning motivation, and self-efficacy, with relatively few studies investigating the influence of the three antecedents on the CGPA. Furthermore, the influence of these factors has not been investigated in the Kingdom of Saudi Arabia. As a result, the current study aims to answer the following research question in light of previous studies and empirical findings:

Research hypotheses

The literature that has been discussed and the evidence from empirical studies provide the basis for the following hypotheses:

H1. There is a positive impact of undergraduate students' interest on their CGPA score
H1a. There is a positive impact of male undergraduate student's interest on their cumulative grade point average score
H1b. There is a positive impact of female undergraduate student's interest on their cumulative grade point average score
H2. There is a positive impact of undergraduate students' perceived self-efficacy on their cumulative grade point average score
H2a. There is a positive impact of male undergraduate students' perceived self-efficacy on their cumulative grade point average score
H2b. There is a positive impact of female undergraduate students' perceived self-efficacy on their cumulative grade point average score
H3. There is a positive impact of undergraduate students' learning motivation on their cumulative grade point average score
H3a. There is a positive impact of male undergraduate students' learning motivation on their cumulative grade point average score

H3b. There is a positive impact of female undergraduate students' learning motivation on their cumulative grade point average score

Methodology

The current study was explanatory, and the hypothesized model included three variables: "student interest," "perceived self-efficacy," and "learning motivation." The present study used the CGPA score as a continuous dependent variable. These three dimensions are used to see their impact on CGPA score. Based on the previous studies, Figure 1 illustrates the link between these three variables and the outcome variable. Based on the foregoing explanation, the following regression model is used in the present investigation:

CGPA score = $\alpha o + \beta_1 (SI) + \beta_2 (PSE) + \beta_3 (LM) + \varepsilon$

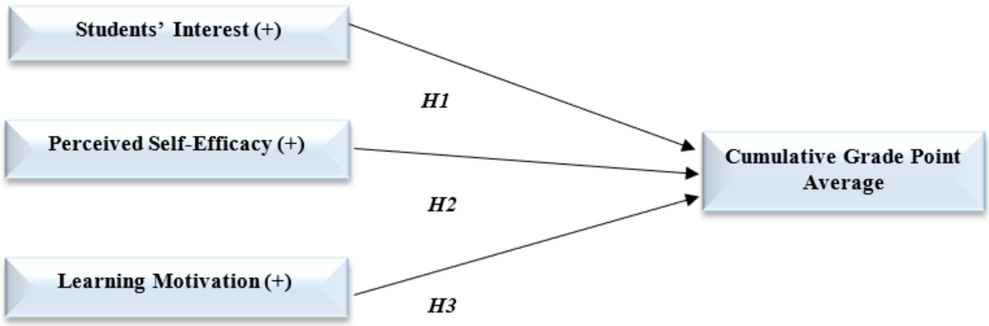

Figure 1. Research Model of the Study

Research design

Consequently, an online questionnaire that participants self-administered via Google Form was used to conduct the cross-sectional survey. Through the Blackboard network, an email was sent to the students who participated asking them to click on a link that led to the intended questionnaire. The present study's sample was derived utilizing non-random sampling strategies that included purposive and convenience sampling. Two hundred and eighty nine undergraduate students from one public university participated in the study.

Measures

Independent variables

The "student interest" among the learners was measured using seven items that were obtained from (Mazer, 2012). This construct was formed using a six-point Likert scale, ranging from "never" (1) to "every time" (7). During instrument piloting, the construct's Cronbach alpha was (n = 30; α = 0.929). Students' "perceived self-efficacy" was measured using eight items adopted from (Chen et al., 2001). A five-point Likert scale, ranging from "strongly disagree" (1) to "strongly agree" (5), was used to develop this construct. In the pilot study, this construct's Cronbach alpha was (n=30; α = 0.885). Six items that were taken from (Noe & Schmitt, 1986; Cole et al., 2004) were used to measure the "learning motivation" of the students. This construct was developed using a six-point Likert scale, which goes from "strongly disagree" (1) to "strongly agree" (6). The Cronbach alpha for this construct during instrument piloting was (n=30; α = 0.857).

Cumulative grade point average (dependent variable)

I am especially intrigued about the impact of students' interest, perceived self-efficacy, and learning motivation on their CGPA. The self-reported average score in all subjects taught in a university program determine educational achievement. A student's CGPA is calculated by multiplying their cumulative completed hours (i.e., hours of credit for which they received a grade) by the total amount of hours in their current semester and the grade values of the subjects they took. It varies throughout each respondent's higher education. The cumulative grade point average CGPA appears as a continuous measure. In essence, a (4.0) GPA, or an (A+ = 95-100; A = 94-90) average across all subjects, is the highest possible score. An average of (3.0) could correspond to a (B+ = 89-85; B = 84-80), (2.0) to a (C+ = 79-75; C = 74-70), (1.0) to a (D+ 69-65; D 64-60), and (0.0) to an (F = 59-0). I coded employing a seven-point scale in *SPSS* and tried out stringent cut-offs (1 = < 2.5, 2 = 2.51-2.75, 3 = 2.76-3.0, 4 = 3.01-3.25, 5 = 3.26-3.50, 6 = 3.51-3.75, 7 = 3.76 & above). Several earlier empirical studies have included

CGPA as a dependent variable (Flashman, 2012; Rosli 2012, Nurudeen et al., 2023).

Results and discussion

Techniques and procedures for studying data

Descriptive along with inferential statistics were performed using the 23rd release of the "*Statistical Package for Social Sciences*" (*SPSS*). Initially, descriptive data were used to determine their mean, standard deviations, frequency range, and percent. The reliability statistics of the loaded items and the "*Pearson correlation*" were examined. The technique of regression analysis was then employed to evaluate the model's ability to predict its hypothesis. To assess the variation in means and variances with regard to the gender variable, group analysis and an independent t-test were also carried out.

Table 1.
Descriptive Statistics

	M	*SD*	Demographics	*f*	%	Cumulative %
Gender	1.51	0.501	Male	113	49.10	49.10
Age	1.71	0.516	Female	117	50.90	100.00
College	1.99	1.135	18-21 years	73	31.70	31.70
CGPA	5.57	0.577	22-25 years	150	65.20	97.00
			26-29 years	7	3.00	100.00
			College of Arts	111	48.30	48.30
			College of Applied Medical Sciences	49	21.30	69.60
			College of Business Administration	32	13.90	83.50
			College of Community	38	16.50	100.00
			2.76-3.0	1	0.40	0.40
			3.01-3.25	7	3.00	3.50
			3.26-3.50	81	35.20	38.70
			3.51-3.75	141	61.30	100.00
			Total	*n* = 230	100.00	

The sample population's major variables and demographic features are summarized in Table 1's descriptive statistics. Values for the mean (*M*) and standard deviation (*SD*) of continuous variables, including age and CGPA, are given. Additionally, frequencies (*f*) and percentages (*%*) are shown for qualitative characteristics like gender and college affiliation. With 113 male (49.10%) and 117 female (50.90%), the gender distribution is fairly balanced, according to the data. The age distribution of the participants reveals that the majority are between the ages of 22 and 25 (65.20%), with a lesser percentage being between the ages of 26 and 29 (3.00%). The College of Arts has the highest frequency (48.30%) among the colleges included in the statistics regarding affiliation.

Table 2.
Pilot study

Sr. #	Variables	No. of Items	Cronbach's Coefficient Alpha	Cronbach Alpha of 21 items
1	Students' Interest (SI)	7	0.929	
2	Perceived Self-Efficacy (PSE)	8	0.885	0.835
3	Learning Motivation (LM)	6	0.857	
Note: (*n*= 30)		21		

Research instrument and piloting

The pilot study's results are displayed in Table 2. The self-administered questionnaire consists of 21 items. After data cleaning, the final sample size for the study consisted of 230 out of the 289 total respondents. Before the main investigation, a pilot study with thirty respondents was carried out. The respondents from the pilot study were not included in the main study.

Table 3.
Means, standard deviations, and inter-correlations between independent variables (n = 230)

	M	*SD*	1	2	3
Students' Interest (SI)	1.0510	0.1501	1		
Perceived Self-Efficacy (PSE)	0.7856	0.0717	.456**	1	
Learning Motivation (LM)	1.3962	0.1577	.510**	.654**	1
Notes: *** p < 0.01(2 - tailed); *p < 0.05(2 - tailed)*					

The means (*M*), standard deviations (*SD*), and intercorrelations between the independent variables are displayed in Table 3. The correlation matrix contains the intercorrelations coefficients between the variables. In particular, there is a significant correlation between Students' Interest and both Perceived Self-Efficacy (r = 0.456, $p < 0.01$) and Learning Motivation (r = 0.510, $p < 0.01$), and a positive correlation between Perceived Self-Efficacy and Learning Motivation (r = 0.654, $p < 0.01$). Strong relationships between the variables are suggested by these statistically significant correlations.

Table 4.
Reliability before factors loading

Sr. #	Variables	No. of items	Individual Alpha	Alpha of 21 items
1	Students' Interest (SI)	7	0.924	
2	Perceived Self-Efficacy (PSE)	8	0.924	0.937
3	Learning Motivation (LM)	6	0.905	
Total Likert scale items		21		
Note: (*n*= 230)				

Reliability data for three variables are shown in Table 4 prior to factor loading. The table provides the reliability coefficient (calculated using Cronbach's alpha) and the number of elements that make up the scale for each variable. The reliability coefficients for learning motivation, perceived self-efficacy, and students' interest are 0.905, 0.924, and 0.924, respectively. High internal consistency within each variable's scale is indicated by these reliability coefficients, indicating that the items accurately assess the underlying components.

Table 5.
Reliability after factors loading

Sr. #	Variables	No. of items	Individual Alpha	Alpha of 16 items
1	Students' Interest (SI)	6	0.922	
2	Perceived Self-Efficacy (PSE)	6	0.898	0.921
3	Learning Motivation (LM)	4	0.892	
Total Likert scale items		16		
Note: (*n*= 230)				

After factor loading, Table 5 displays reliability data for the three variables that make up the scale and the reliability coefficient, which is calculated using Cronbach's alpha. Following factor loading, the reliability coefficients for learning motivation, perceived self-efficacy, and students' interest are 0.892, 0.898, and 0.922, respectively. These coefficients show strong internal consistency within the scale of each variable.

Table 6.
KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.903
Bartlett's Test of Sphericity	Approx. Chi-Square	2938.010
	df	120
	Sig.	0.000

Table 6 displays Bartlett's Test of Sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. The KMO measure, which indicates the percentage of variation across variables that might be shared, comes back with a value of 0.903, over the cutoff of 0.6 and indicating a high degree of factor analysis appropriateness (Kaiser, 1974). The correlation matrix's divergence from the identity matrix is examined using Bartlett's Test of Sphericity, which produces a significant chi-square value of 2938.010 having 120 degrees of freedom and a significance level of 0.000, suggesting significant differences. This suggests that the variables have sufficient correlation, hence validating the suitability of the dataset for factor analysis.

Table 7.
Rotated Component Matrix

Factors Loading Items	Components		
	(SI)	(PSE)	(LM)
SI2 I understand the course material.	0.857		
SI6 I feel like I am learning topics covered in the course.	0.838		
SI5 I realize what is expected of me.	0.825		
SI4 The information in the course is useful.	0.824		
SI3 I can understand the flow of ideas	0.816		
SI7 The information covered in the course is making me more knowledgeable.	0.719		
PSE8 Even when things are tough, I can perform quite well.		0.837	
PSE6 I am confident that I can perform effectively on many different tasks.		0.791	
PSE4 I believe I can succeed at most any endeavor to which I set my mind.		0.781	
PSE5 I will be able to successfully overcome many challenges.		0.750	
PSE7 Compared to other people, I can do most tasks very well.		0.687	
PSE2 When facing difficult tasks, I am certain that I will accomplish them.		0.684	
LM5 I try my best to study the course material.			0.839
LM3 I spend a lot of time for my study.			0.785
LM6 Overall, my learning motivation is very high.			0.745
LM4 Investment in studying the course material is my first priority.			0.730
Eigen values	4.460	3.991	3.359
% of Variance explained	27.873	24.946	20.996
Cumulative % of variance explained	27.873	52.819	73.815
Cronbach's α	**0.922**	**0.898**	**0.892**

Notes: Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization;
Rotation converged in 6 iterations; Factor loadings less than |0.40| were omitted.
SI, Students' interest; PSE, Perceived self-efficacy; LM, Learning motivation

Exploratory factor analysis

In order to obtain the three desired factors, I have utilized the "Principal components" factoring option in *SPSS 23*. To maintain clarity, factor loadings smaller than |0.40| were removed from Table 7. Moreover, Table 7 demonstrates that all loaded items in EFA were more than |0.67|, indicating a highly robust convergent and construct validity (Cooper et al., 2007; Field, 2009; Hair et al., 1998; Hair et al., 2009; Tharenou et al., 2007). In the rotated component matrix table, the factor loadings obtained via a principal component analysis with Varimax rotation (Kaiser normalization) are displayed. The purpose of this research was to determine the underlying variables or dimensions that were associated with learning motivation (LM), perceived self-efficacy (PSE), and students' interest (SI). As seen, Factor 1 (SI) shows high loadings (range 0.719 to 0.857). Similarly, Factor 2 (PSE) shows a significant loading of items associated with Perceived Self-Efficacy, with loadings ranging from 0.684 to 0.837. Finally, Factor 3 (LM) shows a substantial loading of items, with loadings ranging from 0.730 to 0.839. Finally table 7 shows the dependability and explanatory power of the extracted components. The eigenvalues demonstrate the amount of variation explained by each component obtained in the study. In this instance, the initial component, possessing an eigenvalue of 4.460, is capable of elucidating a substantial portion of the overall variation in the data. Likewise, the second and third components possess eigenvalues of 3.991 and 3.359, respectively, signifying their noteworthy contributions to the explained variance. Examining the proportion of variation explained by each element can provide further insights. For instance, the first factor represents 27.873% of the variation, the second factor represents 24.946%, and the third factor represents 20.996%.

Table 8.
Means, standard deviations, and correlations among all variables (n = 230)

	M	*SD*	1	2	3	4
Students' Interest (SI)	1.0510	0.1501	1			
Perceived Self-Efficacy (PSE)	0.7856	0.0717	.456**	1		
Learning Motivation (LM)	1.3962	0.1577	.510**	.654**	1	
CGPA (dependent variable)	5.5700	0.577	0.369**	0.600**	.546**	1
Notes: *** p < 0.01(2 - tailed); *p < 0.05(2 - tailed)*						

The means, standard deviations, and correlations between the variables are shown in table 8. Numerous noteworthy conclusions are drawn from the correlations' analysis. First off, there are positive connections between Students' Interest and CGPA (r = 0.369), Learning Motivation (r = 0.510), and Perceived Self-Efficacy (r = 0.456), all of which are considered significant at $p < 0.01$. This suggests that increased perceived self-efficacy, learning to motivation, and students interest are significantly linked to their academic performance. Furthermore, a robust positive association is shown between Perceived Self-Efficacy and both Learning Motivation (r = 0.654) and CGPA (r = 0.600), with a statistical significance of $p < 0.01$. This shows that motivated students tend to do better academically and earn higher grades when they believe they are capable of doing so. Furthermore, there is a positive association (r = 0.546) between learning motivation and CGPA, suggesting that students who are more motivated tend to perform better academically. Overall, as shown via their significant correlations with CGPA, these results highlight the significance of students' motivation, interest, and perceived self-efficacy in predicting academic achievement.

Table 9.
Testing hypotheses with entry method-based simultaneous regression análisis

Hyp.	Predictors	β	SE	*t*-stat.	Sig.	VIF	Relationship observed	Remarks
	(Constant)	1.477	0.336	4.393	0.000			
H1	SI	0.208	0.234	0.891	0.374	1.401	positive	Not Supported
H2	PSE	3.318	0.556	5.965	0.000***	1.811	positive	Supported
H3	LM	0.911	0.261	3.482	0.001***	1.937	positive	Supported
DV: CGPA								
Notes: $F(3, 226) = 50.960$, ($p<.001$); *Adj* $R^2 = 0.396$ *$p < 0.05$								

Hypothesis testing and regression análisis

The findings of testing the hypotheses using simultaneous multiple linear regression analysis for predicting "CGPA" (dependent variable) are shown in Table 9. The combination of variables predicted approximately 39.6% of the total variance in predicting the CGPA The study's predicted regression model was significant (F(3,226 = 50.960, $p < 0.001$), and it found that, aside from "students' interest," only two factors substantially predicted the outcome variable CGPA. The link between the predictors and the dependent variable is represented by the value of β. It is clear from Table 9 that all three of the predictors have positive β values. This proves that in a model with two variables, "perceived self-efficacy" and "learning motivation" have a positive significant impact on CGPA. On the other hand, "student interest" has a positive but insignificant impact on the CGPA. The variables used for prediction do not exhibit multicollinearity since their variance inflation factor (VIF) is lower than 10. If the VIF is more than 10, multicollinearity has been observed (Woodrow, 2014). The coefficients of parameter estimations indicate that "perceived self-efficacy" (3.318; t 5.965, $p < 0.05$) and "learning motivation" (0.911; t 3.482, $p < 0.05$) have a statistically significant impact on CGPA. Thus, two hypotheses (*H2* & *H3*) were supported. However, "students' interest" (0.208; t 0.891, $p < 0.05$) had a statistically insignificant impact when predicting CGPA, hence (*H1*) was not supported. The regression equation to predict CGPA is displayed in the following equation:

$$\text{CGPA score} = 1.477 + 0.208\ (\text{SI}) + 3.318\ (\text{PSE}) + 0.911\ \text{LM}$$

Table 10.
Multiple regression (male model); Dependent variable: CGPA

Hyp.	Predictors	β	SE	t-stat.	Sig.	VIF	Relationship observed	Remarks
	(Constant)	2.26	0.585	3.863	0.000			
H1a	SI	0.244	0.502	0.487	0.627	1.616	positive	Not Supported
H2a	PSE	2.772	1.042	2.661	0.009**	2.059	positive	Supported
H3a	LM	0.533	0.442	1.205	0.231	2.173	positive	Not Supported

Notes: $F(3, 109) = 10.475$, (p<.001); *Adj* $R^2 = 0.202$ *$p < 0.05$

The findings of testing the hypotheses using simultaneous multiple linear regression analysis for predicting CGPA with respect to male gender are shown in Table 10. The combination of variables predicted approximately 20.2% of the total variance in predicting the CGPA. The coefficients of parameter estimations indicate that "perceived self-efficacy" (2.722; t 2.661, $p < 0.05$) has a statistically significant impact on CGPA. Thus, hypothesis (*H2a*) was supported. However, male “students’ interest” (0.244; t 0.487, $p < 0.05$) and “learning motivation” (0.533; t 1.205, $p < 0.05$) had a statistically insignificant impact when predicting CGPA, hence (*H1a* & *H3a*) were not supported.

Table 11.
Multiple regression (female model); Dependent variable: CGPA

Hyp.	Predictors	β	SE	t-stat.	Sig.	VIF	Relationship observed	Remarks
	(Constant)	0.78	0.313	2.491	0.014			
H1b	SI	0.364	0.192	1.894	0.061	1.336	positive	Not Supported
H2b	PSE	3.385	0.485	6.982	0.000***	1.676	positive	Supported
H3b	LM	1.347	0.25	5.394	0.000***	1.807	positive	Supported

Notes: $F(3, 113) = 84.024$, (p<.001); *Adj* $R^2 = 0.682$ *$p < 0.05$

Table 11 displays the findings of evaluating the hypotheses for predicting CGPA with regard to female gender using simultaneous multiple linear regression analysis. The combination of variables predicted approximately 68.2% of the total variance in predicting the CGPA. The coefficients of parameter estimations indicate that female students’ "perceived self-efficacy" (3.385; t 6.982, $p < 0.05$) and “learning motivation” (1.347; t 5.394, $p < 0.05$) have a statistically significant impact on CGPA. Thus, hypotheses (*H2b* & *H3b*) were supported. However, female student’ interest (0.364; t 1.894, $p < 0.05$) had a statistically insignificant impact when predicting CGPA, hence (*H1b*) was not supported.

Table 12.
Group Statistics

	Gender	n	M	SD	Std. Error Mean
CGPA	Male	113	5.43	0.581	0.055
	Female	117	5.71	0.542	0.05

Group statistics for CGPA according to gender are shown in table 12. Each gender group's standard error of the mean, standard deviation, mean, and number of participants are shown in table 12. The mean CGPA for male (n = 113) is 5.43, with a standard deviation of 0.581 and a mean standard error of 0.055. The mean CGPA for females (n=117) is 5.71, with a standard error of the mean of 0.05 and a significantly smaller standard deviation of 0.542. This table compares male and female participants' CGPAs, providing insight into potential gender variations in academic achievement within the sample group.

Table 13.
Independent Sample Test: Mean comparison of CGPA score of male and female

Dependent Variable	Male		Female				
CGPA score	*M*	*SD*	*M*	*SD*	*t*(225.612)	*p*	Cohen's d
	5.43	0.581	5.71	0.542	3.72	0.000	0.498

An independent sample *t-test* was also conducted to compare the CGPA score for male and female respondents as shown in table 13. There were significant differences (t (df) = 225.612, p = 0.000) in the scores with mean score for male (M = 5.43, SD = 0.581) was lower than female (M = 5.71, SD = 0.542). The magnitude of the differences in the means (0.276, 95% *CI*: 0.422 to 0.13) was significant. Hence, null hypothesis was rejected. The value of Cohen's *d* was 0.498 (< 0.50) which indicated medium effect size (Cohen, 1988).

Conclusions

This research aimed to examine the correlation and effect of three factors: "learning motivation," "perceived self-efficacy," and "students' interest" on the CGPA of undergraduate students. Data for the study were gathered from 230 undergraduate students at a public university. The data was analyzed using descriptive statistics, exploratory factor analysis, linear regression, zero-order correlation, and an independent t-test. The variable combination predicted approximately 39.6% of the overall variance in predicting the CGPA. The study's predicted regression model was significant (F(3,226 = 50.960, p 0.001), and it indicated that, aside from "students' interest," only two factors significantly predicted the outcome variable CGPA to the current study's findings, the "students' interest" variable did not affect undergraduate students' CGPA. Furthermore, regression was performed separately on male and female students, and it was discovered that the "students' interest" variable has no significant influence on their CGPA. According to the findings, there is a positive and statistically significant correlation between undergraduate students' "learning motivation," "perceived self-efficacy," and "students' interest."

Practical implications of the study

It is a serious concern at higher education level that students' interest vary due to wide range of learning settings. Teachers and authorities may enhance academic learning for all students by fostering the development of interests. Cultivating interest amongst students preserves involvement, improves learning, and optimizes academic achievement. Teachers, instructors, and professors at the tertiary level must consider "learning motivation," "perceived self-efficacy," and "students' interest" as essential variables in encouraging students' academic progress. Teachers and instructors are essential in fostering the development of interests among students at higher education level. Moreover, the conceptualization of academic settings that students confront is in the hands of teachers and policymakers. The curriculum may be modified and revised by these important stakeholders to support the growth of each student's interest and learning motivation.

Limitations of the study and recommendations for further research

Everyone who participated in the present investigation were undergraduate students, and data were gathered from students at a single public university. In this study, "learning motivation," "perceived self-efficacy," and "students' interest" were the only three factors used to examine the connection and effect on the CGPA score of undergraduate students. In the future, studies could look into the relationship between academic resilience, academic commitment, burnout, and anxiety as a mediator or moderator, as well as verify the impact on students' CGPA at private and public universities to obtain more generalizable results.

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Ensuring transparency and publicity of local budgets in Ukraine in the face of new challenges

Забезпечення прозорості та публічності місцевих бюджетів в Україні в умовах нових викликів

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Abstract

The article analyzes the essence and features of transparency and publicity of local budgets in Ukraine and abroad using advanced foreign experience. The need to ensure transparency and publicity of local budgets is substantiated. International ratings of openness and transparency of local budgets are considered. Successful projects and practices in ensuring budget transparency and publicity are analyzed. The features of ensuring budget transparency and publicity in war conditions are determined. Recommendations are proposed to increase the transparency and publicity of local budgets in Ukraine in the face of new challenges.
To achieve the goals of this article, general scientific and special methods were used, such as the structural-functional method (to study individual tools, successful projects, and practices in ensuring transparency and publicity

Анотація

У статті аналізується сутність та особливості прозорості і публічності місцевих бюджетів в Україні та за кордоном на прикладі передового зарубіжного досвіду. Обґрунтовано необхідність забезпечення прозорості та публічності місцевих бюджетів. Розглянуто міжнародні рейтинги відкритості та прозорості місцевих бюджетів. Проаналізовано успішні проєкти та практики у забезпечення бюджетної прозорості та публічності. Визначено особливості забезпечення бюджетної прозорості та публічності в умовах війни. Запропоновано рекомендації щодо підвищення прозорості та публічності місцевих бюджетів в Україні в умовах нових викликів.
Для досягнення цілей даної статті було використано загальнонаукові та спеціальні методи, такі як: структурно-функціональний метод (для дослідження окремих інструментів,

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of local budgets), comparison method (comparison of data openness across countries, successful projects, and practices in ensuring budget transparency and publicity). All this made it possible to develop measures to ensure transparency and publicity of local budgets in Ukraine in the face of new challenges.

Keywords: local budgets, budget transparency and publicity, international ratings, decentralization, war, new challenges.

успішних проєктів та практик у забезпеченні прозорості та публічності місцевих бюджетів); метод порівняння (порівняння відкритості даних за країнами, успішних проєктів та практик у забезпеченні бюджетної прозорості та публічності). Все це дало можливість розробити заходи забезпечення прозорості та публічності місцевих бюджетів в Україні в умовах нових викликів.

Ключові слова: місцеві бюджети, бюджетна прозорість та публічність, міжнародні рейтинги, децентралізація, війна, нові виклики.

Introduction

Research into the strategic course of modernizing public finances and seeking to adapt it to EU requirements should be considered in the context of research into medium-term budget planning, budget transparency, control, and combating tax fraud. The main aspects of deepening cooperation between Ukraine and the EU and the content and directions of bringing Ukrainian legislation closer to the EU acquis communautaire were determined by the Association Agreement with the EU, which was signed in 2014. Since 2017, the Agreement entered into force, several measures have been implemented to increase budget openness and public participation in the budget process. Ensuring the prompt, proper, and continuous implementation of local budgets is extremely important in martial law conditions.

The results of the work are to determine the features and ensure budget transparency and publicity in war conditions, taking into account the following factors: the status of the community, region, the presence of important military strategic facilities and critical infrastructure facilities in a particular region or territory; the results of the review of interbudgetary relations; the emergence of a new management level — the requirements and challenges of European integration.

In addition, successful projects and practices in ensuring budget transparency and publicity were studied, which made it possible to develop recommendations for increasing the transparency and publicity of local budgets in Ukraine in the face of new challenges: digitalization and transparency, digital ecosystem "Dream"; openness and transparency in management; system for monitoring and assessing regional development; municipal statistics and administrative supervision; e-democracy: rethinking citizen participation; activating people through e-democracy.

Literature review

The study of openness and transparency of local budgets is quite relevant since society always shows an interest in proper financial support, on which the city's socio-economic development depends. Thus, the local budget is the main document showing not only the activities of the government body but also how well it satisfies the population's needs for public services.

The article also used a methodology for assessing the transparency of local budgets. The methodology was developed under the general editorship of O. Holynska and A. Matvienko (2017).

According to T. Wood & M. Aronczyk (2020), democratic communication within the state is based on the principles of publicity and transparency: when, through publicity, it becomes possible for transparency to demonstrate its communicative ability.

Moreover, M. Huba & M. Lynetsky (2022) consider publicity and transparency of the local budget as an instrument of anti-corruption policy at the local government level. According to scientists J. Nakonechna and L. Demydenko (2016), if information transparency and accessibility of the state of local budgets are ensured, corruption can be eradicated in Ukraine, and high levels of financial security in our state can be achieved.

Many scientists have developed conceptual approaches and practical recommendations to increase the transparency and publicity of the budget process and local budgets.

Thus, researchers L. Demydenko, Y. Nakonechna & N. Miedviedkova (2021) substantiated the need to improve the use of tools to increase transparency and publicity, taking into account international experience, and also identified ways to increase the efficiency of using these tools to ensure the socio-economic development of regions. N. Miedviedkova & A. Karpych (2021) analyzed practices for increasing the level of publicity and transparency of Ukrainian local budgets. They are also respected by the world experiment in increasing transparency and publicity of local budgets (Miedviedkova & Karpych., 2023).

Yevtushenko M. (2018) provides recommendations for organizing information systems of local governments to increase the accessibility and simplify the perception of information on local budgets by representatives of civil society, as well as introducing changes to the regulations for the exchange of information between local financial authorities and the State Treasury Service of Ukraine in terms of improving monitoring expenditures of local budgets through interbudgetary transfers from the state budget, the use of which provides for co-financing.

A. Demianiuk (2016) notes that to increase the level of transparency of budgets, the public should be more actively involved in the budget process. Researches S. Diachenko & Ye. Fetishchenko (2016) propose that the Ministry of Finance of Ukraine annually, during the preparation of the draft State Budget of Ukraine, prepare a public budget and bring it to the public-on-public web portals using various visualization methods as well as use such public participation mechanism as public consultations.

The group of scientists I. Lyutiy, Yu. Petlenko, & N. Drozd (2022) developed conceptual approaches to ensuring the effective use of budget resources in the defense and security sector by summarizing the practical implementation of the principles of openness and transparency of budgeting, developing effective mechanisms for budget oversight, and compliance with public accountability standards.

The results of these studies indicate that the policy of ensuring transparency and publicity of local budgets in Ukraine could be more effective. Paying tribute to the developments of domestic economists, we note that some issues require additional research, especially in the context of the latest global challenges.

The purpose of the study is to analyze the state of ensuring transparency and publicity of local budgets, in particular, to summarize global and domestic practices of successful projects in ensuring budget transparency and publicity, as well as recommendations for their improvement in the face of new challenges.

To achieve these goals, the following tasks were set: 1) study successful projects in world practice; 2) study the approaches of foreign and domestic scientists to ensuring publicity and transparency of local budgets; 3) analyze domestic experience; 4) study the problems arising in the face of new challenges; 5) consider the prospects for increasing the transparency and publicity of local budgets in the face of new challenges.

Methodology

Methods of theoretical generalizations are used to study the theoretical foundations of ensuring budget transparency and public participation in the budget process, as well as deepening the content of transparency of the budget process and clarifying the concept of openness and transparency in the budget process (Bak, 2014; Huba & Lynetsky, 2022; Demianiuk, 2016; Petlenko, Drozd, & Morgun, 2021).

Many scientists have used several scientific approaches to analyze the achieved level of budget transparency, as well as the transparency of the budget process in Ukraine (Bak, 2014; Demianiuk, 2016).

Researcher Zhabynets (2019) used the comparison method to analyze the fulfillment of legislative requirements on disclosing information about the budget between equal united territorial communities (comparing information about the budget, passports of budget programs, and budget execution).

I. Lyutiy, Yu. Petlenko., & N. Drozd (2022) provided an empirical description and used data from expert discussions and approaches to the multidimensional assessment of the openness and transparency of the budget process in the defense and security sector to improve the efficiency of the use of military budget funds.

To achieve the goals of this work, general scientific and special methods were used, such as:

– ***structural-functional method*** (for studying individual tools, successful projects, and

practices in ensuring transparency and publicity of local budgets);
- ***comparison method*** (comparison of data openness across countries, successful projects, and practices ensuring budget transparency and publicity). This method involved comparing countries using the Public participation, Budget Oversight, and Transparency indices.

To understand the progress made by the Ukrainian government in achieving publicity and transparency of local budgets, we will look at the dynamics of recent years, which have made it possible to understand the shortcomings and risks of the local finance system. This, in turn, allows us to develop recommendations regarding measures to increase the transparency and publicity of local budgets in Ukraine in the face of new challenges.

The structural-functional method was used to identify types of risks in the field of public finance, namely: Open budget planning and execution of budgets, Boost-analysis budget analysis tool, Spending use of public funds, Proifi international financial projects (MFO loans), Education expenses, Reimbursement VAT, State banks, Debt policy, Foreign trade indicators, Financial market indicators, Investment policy of the Ministry of Finance, Efficiency of use of funds, Budget widget, Chrome extension, Telegram bot, Training courses. An integrated approach to the research allowed us to form a holistic picture of domestic projects and successful foreign practices recommended for Ukraine to use in the face of new challenges.

The comparative method was used to review successful projects and practices ensuring budget transparency and publicity. Budget Visualization, Participatory Audit, Online Budget Consulting Tools, Participatory Budget, and Gender-Responsive Budgeting were compared.

We analyzed the public availability of budget documents in Ukraine in the context of documents such as the pre-budget statement, executive budget proposal, adopted budget, public budget, current reports, semi-annual review, annual report, and audit report during 2010-2021. A positive trend is that the public budget has been available since 2017. The analysis allowed us to conclude that, in general, the public receives all the necessary information.

We also used another report, the Open Budget Survey (OBS), which assesses the public's ability to determine how the central government collects and spends public resources. In addition to Ukraine, we considered Bulgaria, Moldova, Slovakia, Romania, Armenia, Poland, the Czech Republic and Hungary. We concluded that since 2015, there has been a positive trend: Ukraine has increased its rating from 46 to 65.

Policy, Portals, Impact, and Data quality are considered to build the open data ranking. In turn, their components were compared: Policy consists of Policy framework, governance of open data, open data implementation; Portals – of indicators Portal features, Portal usage, Portal provision, Portal sustainability; Impact – of indicators Strategic awareness, Measuring re-use, Created impact; Data quality – of indicators Monitoring and measures, Currency and completeness, DCAT-AP Compliance, Deployment Quality.

Results and Discussion

The need to ensure transparency and publicity of local budgets

The formation of local budgets is an important component of budget policy, determines the degree of effectiveness of the implementation by local self-government of the functions and powers assigned to them, and affects the socio-economic development of administrative-territorial units.

Undoubtedly, the principle of transparency of the budget system and its publicity is specified in Article 7 of the Budget Code of Ukraine. It should also be noted that the budget system as “the totality of the state budget and local budgets” (clause 2.1.5 of the Budget Code of Ukraine) is transparent since the content of the State budget and local budgets is obvious. The latter's composition is clearly standardized by law (clause 2.1.34 of the Budget Code of Ukraine) (Bak, 2014).

Compliance with the principles of transparency and publicity of the budget process is important for establishing trusting and transparent relations between citizens and authorities, particularly in finance.

The introduction of modern IT technologies into the management process allows local governments to become not only the official but also the only source of high-quality and accessible information about every community budget. An effective combination of open information, transparent budget decision-making, and innovative practices in the budget process can become a driving force for establishing a new budget policy in Ukrainian communities (Pleddg, 2020).

Also, on March 11, 2022, the Government of Ukraine adopted Resolution "Some issues of the formation and execution of local budgets during martial law" No. 252, which defines the features of the formation and execution of local budgets during martial law (Resolution No. 252, 2022).

In particular, it states that the formation of local budgets and ensuring the uninterrupted functioning of institutions and institutions of the public sector and public utilities is carried out by budget legislation, taking into account the following features:

- local government bodies, their executive bodies, local state administrations, and military-civil administrations continue to exercise budgetary powers;
- the executive committees of the relevant local councils, local state administrations, civil-military administrations, or military administrations manage local finances according to the needs and characteristics of the military conditions;
- local financial authorities ensure the preparation of draft local budgets according to the requirements of the Budget Code of Ukraine;
- the State Treasury Service provides settlement and cash services for local budgets and reporting on the execution of local budgets using electronic media;
- temporarily, until the termination or cancellation of martial law, inspections by the State Audit Service on the implementation of local budgets are not carried out, and the inspections that have begun are stopped.

International ratings of openness and transparency of local budgets

It should be noted that before the war, the level of transparency in Ukraine could be defined as high, confirmed by international ratings:

- Open Data Maturity Report (ODM) – 2nd place out of 35 (97% open data maturity (2022));
- Corruption Perceptions Index (CPI) – 116 out of 180 countries in the world in the ranking (33 points out of 100 (2022));
- Open budget survey (OBS) – 65 points scored (2021).

The Open Budget Survey (OBS) ranks countries by their level of accountability in national budget processes. It is the world's only comparative, independent, and regular assessment of transparency, oversight, and participation in national budgets in 120 countries.

A country's budget transparency score, reflected in the Open Budget Index, evaluates the public's access to timely and complete budget information. A transparency score of 61 (out of 100) indicates that a country publishes enough information to support informed public debate (International Budget Partnership, 2021).

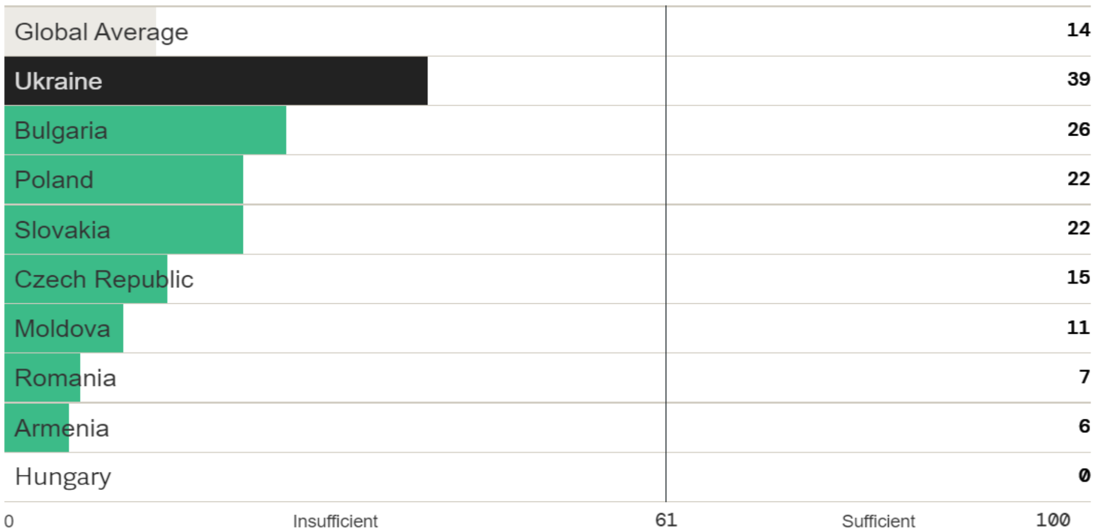

Fig. 1. Public participation in Ukraine compared to others

The OBS evaluates the formal opportunities provided for the public to meaningfully participate in various stages of the budget process. It examines the practices of the central executive, legislature, and supreme audit institution using 18 equilibrium indicators aligned with the Global Initiative for Fiscal Transparency's principles of public participation in fiscal policy and scores each country on a scale of 0 to 100.

Ukraine has a public participation score of 39 (out of 100).

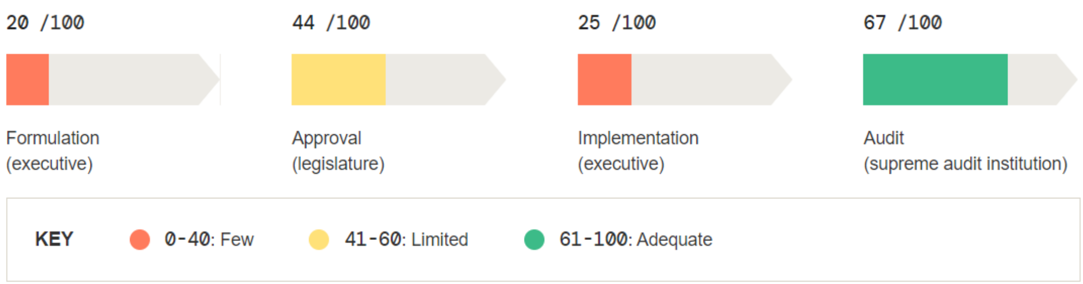

Fig. 2. Extent of opportunities for public participation in the budget process.

The International Budget Partnership organization draws attention to several factors that determine the need for transparency in the budgets of countries worldwide (International Budget Partnership, 2021).

Transparency can help attract cheaper international loans: we found that, after controlling for various economic variables, countries with higher levels of fiscal transparency have higher credit ratings and a lower gap between lending and lending rates, thus lowering the cost of borrowing states;

- opacity in financial matters can undermine fiscal discipline: a study by the International Monetary Fund (IMF) found that one of the essential methods for calculating a country's financial reliability and solvency is the indicator of the transparency of its financial systems and practices. Looking at the recent global economic crisis, the IMF study attributes nearly a quarter of unexpected government debt among the countries studied to a lack of available information about the government's financial position;
- transparency and public participation help to identify leaks and improve the efficiency of government spending by identifying instances of misuse of funds and obliging the government to return money spent unreasonably;
- transparency and public participation contribute to the fair distribution of national resources in accordance with national priorities.

The state of ensuring transparency and publicity of local budgets in Ukraine

Transparency and openness of budget information is the key to the effective use of budget funds and public control over public funds, given the growth of the budget openness index can be considered an important indicator of the success of the implementation of reforms in the budget sector at both the state and local levels. Ukraine's main problems in budget transparency are violation of deadlines and insufficient completeness of the publication of budget documents in the budget process. In particular, many analytical studies have been devoted to this issue (Boex et al., 2023; Alt, 2019).

The government untimely submits documents on the basics of budget policy for the next year, the deadlines for promulgating the draft budget are violated, there is no information on semi-annual budget reports, the Law on the State Budget of Ukraine, and the decision to approve local budgets were not adopted in a timely manner. The study proposed using a quick test to assess the transparency of local budgets (Slukhai et al., 2019).

The process of financial decentralization that began in 2015 provided local governments with new sources of their own income. At the same time, it became possible to implement participatory budgets for broad public involvement. Financial decentralization has generally increased the budgets of territorial communities to meet their socio-economic needs. At the same time, there is no empirical evidence that the above-mentioned fact automatically provided the population with high-quality local public services — education, healthcare, etc.

The consolidation of territorial communities from 11 thousand local budgets to 1460, as of November 2023, helps to optimize costs for the maintenance of the social sphere and increase allocations for priority areas of the territorial community's economy and social development. The key task of further development of fiscal policy is to stimulate the efficient use of local budget funds.

The publication of information on the civil budget began positively in 2015–2016, which deserves further widespread use in the budget process. Involving the general public in the budget process will ensure greater transparency and openness of local finances and ultimately their orientation towards public satisfaction with public goods and services at both the state and local levels (Zakharii et al., 2019).

The unprovoked aggression of the Russian Federation caused significant damage at the community level, destroying civilians, local infrastructure, and businesses; according to the latest figures, about 6.2 million Ukrainians left the country, of which 5.6 million found refuge in various EU countries. But despite the dire consequences suffered by those who survived the occupation of the territories, life is gradually returning to the liberated territories and communities (Refugee (n.d.)).

Under martial law, legislation was updated; the right to make changes to the local budget was granted to the executive committees of the relevant local councils, local state administrations, military-civil administrations, or military administrations on the proposal of local financial authorities without making a corresponding decision by the relevant local councils.

In November 2022, the right to approve and amend community budgets upon the proposal of local financial authorities was returned exclusively to local councils or military administrations of settlements in the event of their creation. However, this norm during its operation made it possible to ensure the continuity of the budget process. To some extent, it deprived compulsory health insurance of the right to adopt solutions.

The budget process has been somewhat simplified by the abolition of certain requirements for the publicity of the budget process, provided for in Art. 28 of the BCU, simplification of the reporting process, abolition of the application of regulatory procedures and norms for coordinating the provision of state assistance to business entities. An analysis of budgetary processes at the level of local communities is presented in the study "The Impact of War on the Budgets of Territorial Communities" (Decentralization, 2023).

Local governments that have received sufficient powers as a result of the decentralization reform must, under martial law, perform additional tasks due to modern challenges: keep records of internally displaced persons; assist internally displaced persons in processing social payments; provide food packages and necessities; organization of assistance with goods and services for the organization of psychological support; assistance in providing medical services; educational services for children of preschool and school age who are classified as internally displaced persons, as well as for children who have traveled abroad, but continue to study remotely in Ukrainian schools.

To summarize, we note that after the end of the war, local self-government bodies will be faced with the issues of returning citizens and creating conditions for full integration into the life of the community, improving the socio-economic conditions of all residents of the community by their wishes and vision for the development of the territory.

Under martial law, reforms aimed at integration into the EU continue, where local government plays an important role. The Ministry of Development of Communities, Territories, and Infrastructure of Ukraine on 7-11-2023 presented a roadmap for the reform of local self-government bodies and the territorial organization of power, where a significant place is given to compliance with the principles of transparency, openness, and accountability of the activities of local self-government bodies.

Successful projects and practices to ensure budget transparency and publicity

Research into the strategic course of modernizing local finance and finding ways to adapt it to EU requirements should be considered in the context of research into transparency and publicity of budgets. The main aspects of deepening cooperation between Ukraine and the EU and the content and directions of bringing Ukrainian legislation closer to the EU acquis communautaire were determined by the Association Agreement with the EU, which was signed in 2014. Since 2017, when the Agreement entered into force, several measures have been implemented in the following areas:

The most successful examples are the E-Data, ProZorro, and DoZorro projects.

E-data is an open data platform in the field of public finance, implemented in pursuance of the order of the Cabinet of Ministers of Ukraine dated February 11, 2016, No. 92-r "On approval of the Concept for creating an integrated information and analytical system "Transparent Budget."

Thus, it is not only an official state information resource that presents information in open data format but also an accessible tool for public control over the planning and use of public funds.

Users of E-data are citizens of the country, government bodies and institutions, and international organizations (Fig. 3).

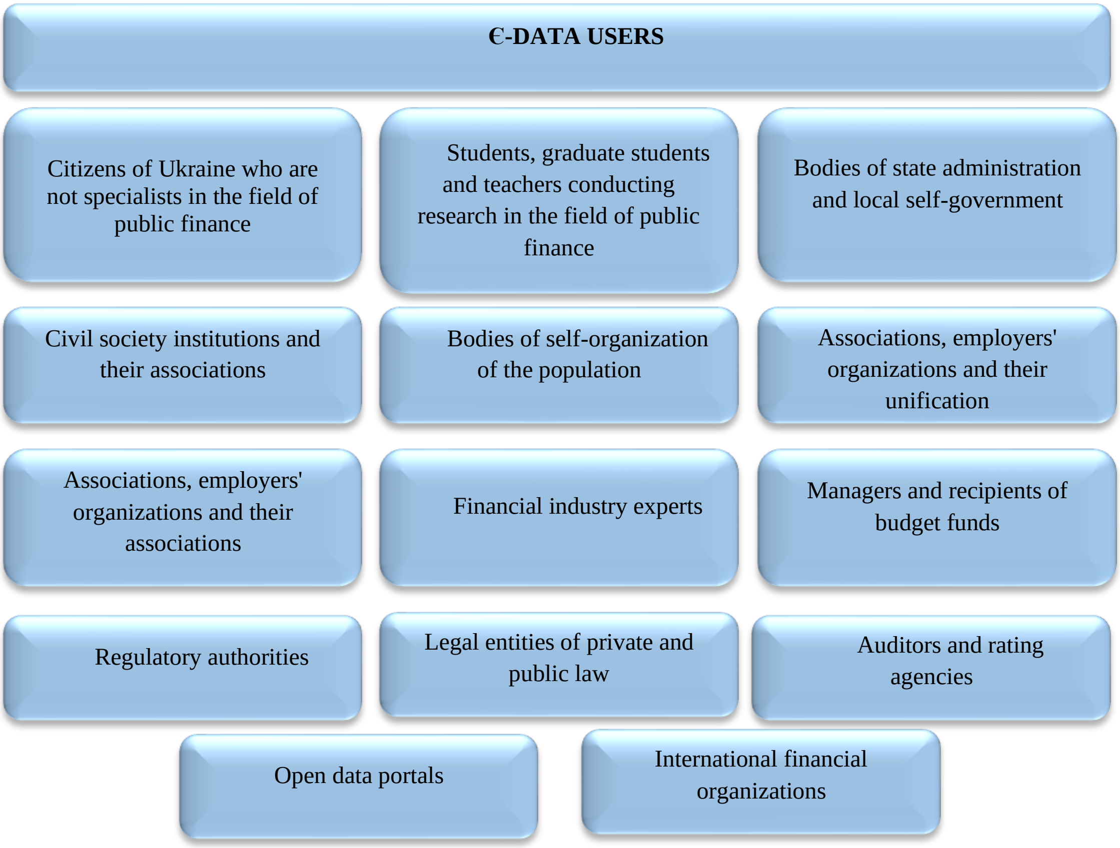

Fig. 3. Є-DATA USERS

It is important to note that E-data includes 16 modules:

Table 1.
E-data modules

Module name	Content
Open budget planning and execution of budgets	Information on budget planning and execution at the state and local levels
Boost analysis budget analysis tool	Analytical tool for studying budget execution indicators at all levels
Spending use of public funds	Information on the use of public funds from state and local budgets by managers.
Proifi international financial projects (MFO loans)	Register of projects implemented with the involvement of funds from international financial organizations.

Education Expenses	Analytical tool for analyzing the activities of higher and secondary education.
VAT refund	Register of applications for the return of the amount of budgetary reimbursement of value-added tax.
State banks	Key performance indicators of state-owned banks and information on non-performing loans.
Debt policy	Register of state guarantees, list of primary dealers, calendar, and auction results.
Foreign trade indicators	Analytical tool for analyzing the volume of import-export of goods.
Financial Market Indicators	Key indicators of the money market, capital market, and foreign exchange market
Investment policy of the Ministry of Finance	Investment instruments and credit ratings of international agencies.
Efficiency of use of funds	Results of financial control over the use of budget funds
Budget widget	Presentation of the community's main budget indicators on its web page.
Chrome extension	Quick access and a convenient way to move platform modules.
Telegram bot	E-data platform messenger — information about the public finances of the state
Training courses	Financial and budget literacy, open data, public control.

Policy, Portals, Impact, and Data quality are considered to build the open data ranking. In turn, Policy consists of Policy framework, Governance of open data, Open data implementation, Portals – of indicators Portal features, Portal usage, Portal provision, Portal sustainability, Impact – of indicators Strategic awareness, Measuring re-use, Created impact, Data quality – of indicators Monitoring and measures, Currency and completeness, DCAT-AP Compliance, Deployment Quality).

Table 2.
Open Data Rating

Country	Policy	Portal	Impact	Data Quality	Open Data Maturity
Ukraine	640	617	600	606	97%
Switzerland	495	475	320	517	71%
Sweden	572	463	510	437	78%
Spain	632	591	560	545	92%
Slovenia	615	613	455	598	90%
Slovakia	480	300	280	448	59%
Romania	435	571	300	394	68%

Prozorro is an electronic system that ensures the openness of government tenders in Ukraine. Since its founding, it has received several international awards, particularly as the most transparent procurement system in the world. The Wired and The Economist have written about its phenomenon in the fight against corruption and involving citizens in controlling budget expenditures.

Until 2016, the area of public procurement in Ukraine was closed and corrupt. Information about tenders was published by the state enterprise "Vneshtorgizdat" in the newspaper "Bulletin of State Procurement" with a circulation of several hundred copies. Interested parties purchased the newspaper's circulation, and bid proposals could only be submitted in paper. Undoubtedly, many sentences were “lost” on the way to the addressee.

From April 1, 2016, the Prozorro system became mandatory for central authorities and monopolists, and from August 1, 2016, it became mandatory for other public customers. The sphere of public procurement is regulated by the Law of Ukraine, “On Public Procurement,” the main policy maker in this area is the Department of Public Procurement, which is part of the Ministry of Economy. SE "Prozorro" and the electronic system Prozorro are 100% owned by the state of Ukraine and subordinate to the Cabinet of Ministers (Prozorro, n.a.).

Since the beginning of the full-scale invasion, Prozorro has not stopped working for a day, and now its use is only expanding. Due to this, the Ministry of Defense has returned to conducting procurement in the system and is saving billions of UAH. International donors have begun purchasing from Prozorro, and citizens are increasingly monitoring how funds are spent during the war and influencing the determination of priorities.

The ***DoZorro*** monitoring portal is a platform where each participant in the system (supplier, customer, regulatory body, citizen) can provide feedback to the government customer or supplier, discuss and evaluate the conditions of a specific procurement, analyze the procurement of a separate government body or institution, prepare and submit an official appeal to regulatory authorities and much more.

For public activists and the media, the portal allows you to discuss a specific tender with potential and existing suppliers, find their expert opinion on the correctness of the wording in the tender documentation, receive professional expertise, etc. But the main thing is that it is a convenient tool for managing monitoring —after all, keeping records of monitored procedures and violations found thanks to the portal has become very simple.

Government customers can evaluate a specific supplier, analyze business feedback, make appropriate procurement process changes, and create their risk management system (Dozorro, (n.a)).

Local budgets are important because they establish allocating resources to provide public services, promote economic development, and provide a platform for democratic participation and citizen engagement. Effective local budgeting is critical to the well-being of its residents. However, several characteristics make local budgets unique (Lyutiy, 2023).

Foreign experience shows that there are also projects that are more aimed at ensuring publicity while promoting budget transparency. These include Budget Visualization, Participatory Audit, Online Budget Consulting Tools, Participatory Budgeting, and Gender Responsive Budgeting.

Visualization of budgets – visibility, creation of conditions for visual monitoring of budget funds, as a rule, at the stages of approval and use. Elements of graphics, infographics, interactive mapping, etc., can be used.

The project aims to present budget information in a way ordinary citizens can understand. Clear budget information contributes to greater public awareness of financial issues in society and motivates more active participation and involvement in budget processes. It is implemented in Poland, the UK, the USA, Kenya, and Ukraine (Chernivtsi, Lviv, etc).

The advantage is clarity and compactness; the disadvantage is the need for additional work from graphic designers, highlighting the most important, color printing (Holynska & Matviienko, 2017).

Participatory audit (Citizen Participatory Audit) is an audit that unites civil organizations (CSOs), citizens, and auditors of the Audit Commission (State Audit Service — Ukrainian) as one audit group. Its goal is to strengthen citizen participation in the government audit process to increase transparency, efficiency, and effectiveness in the use of government resources.

The result is the involvement of citizens in monitoring the use of funds, cooperation between regulatory authorities and citizens, and increased financial discipline of authorities. It is used in Cambodia, the Philippines, Angola, and Indonesia.

The advantages of the practice are the ability of citizens to control spending fully, and the disadvantages are the need for special knowledge and the presence of a significant part of free time.

Online tools for consulting on budget issues — remote consultation of citizens on budget policy issues. The goal is to better understand city residents' priorities in its development, efficient allocation of funds, and improvement of the provision of certain services.

The project results in the formation of partnerships between the authorities and citizens; residents see the opportunity to influence the adoption of important decisions for the city, and local authorities see support for their actions.

It is being implemented in Britain (online info hub “Be Heard”). Through this city, residents can communicate their opinions and proposals on various issues important to the city, including the distribution of budget funds, construction, waste recycling, or social services.

Another tool is the Birmingham Speaks portal, where residents can post their thoughts and ideas for the city's development and evaluate ideas submitted by other citizens, including proposals for the budget.

A similar system operates in the city of Manchester. The Manchester budget page on the city's official website greets residents with the slogan, "Our budget is based on what you say." Here, in particular, the results of consultations with residents and the city development priorities formed based on these consultations are described in detail.

The city of Derby (the UK) also has a separate section (office) for consultations: “Your city - that's up to you to tell.” The advantages of the practice are attracting more potentially active citizens with knowledge and desires but less time for offline meetings. Disadvantages of the practice are the need for a permanent online consultant and additional software for developing an online consulting platform.

Today, local financial authorities face severe challenges related to the war. Considering this, each decision must be balanced and clearly supported by the relevant legislation, which encourages the search for more effective and economical approaches to spending budget funds.

Attracting additional funds can be carried out either by using new sources or by economically and rationally using existing funds. Active citizen participation in this process can be one of the best ways to manage public funds.

Participatory budgeting is one of the forms of democracy at the local level, which provides a systematic approach to involving citizens in the process of making budgetary decisions of a certain territorial community. Participatory budgeting allows citizens to decide where public resources should be spent.

Thus, the public budget is a tool for active citizens to change and improve the city, and the city implements the projects most voted for by residents under public control.

Participatory budgeting provides experience in implementing changes together, improves the “government-community” dialogue, and gives every resident a chance to realize their dream by directly distributing a share of the local budget. In addition, the public budget provides transparency in the decision-making process for developing a city, district, or street.

Although the specifics of each participatory budgeting process may differ, the overall goal is to increase citizen participation in decision-making and promote a more transparent and accountable distribution of public funds.

The participatory budget mechanism originated in Porto Alegre (Brazil) in 1989, and several years after its implementation, it contributed to achieving positive results. In particular, it reduced corruption, significantly improved the quality of education and health care, and improved the city's sewerage and cleaning systems.

Although, in the opinion of many scientists, the participatory budget model introduced in Porto Alegre is considered an ideal model, this model is not the only one used in the world. Since 2000, participatory budgeting began to be actively used in Europe (particularly in Spain, Belgium, Italy, Germany, France, Portugal, Denmark, Switzerland, the Netherlands, and Great Britain) (Kirilenko & Chaikovskaya, 2015). In Central and Eastern Europe (Bulgaria, Moldova, Poland, Romania), the first attempts to begin the participatory budgeting process began only in 2010.

In Ukraine, participation budgeting was implemented in 2015 in Chernihiv, Cherkasy, and Poltava. Later, participatory budgeting gained significant popularity in Ukraine and became one of the most effective tools for cooperation between government and society today.

Due to Russia's full-scale invasion of Ukraine, most public projects have been delayed and will be implemented with adjustments in cost and priority. The fact is that relocated enterprises from the East of Ukraine needed financial support. In return, the budgets of the corresponding cities will receive additional revenue in the form of taxes paid by these enterprises. Thus, if the amount of public budget funds tended to increase over the following years, then in war conditions, on the contrary, it decreased.

Secondly, not only the amount of implementation of initiatives but also the proportional distribution between projects is subject to careful review. Preference will be given to educational and “green” projects and those related to improving small streets. Social projects to improve people's living conditions and social adaptation will also occupy a significant place.

Projects that increase the safety of citizens and provide the equipment for shelters or their modernization are extremely important in war conditions. Energy saving measures are no less important due to damage to energy infrastructure. Therefore, installing solar power plants on the roofs of schools will save electricity and allow classes to be held even when the lights are turned off (Dymnich, 2023; Polivchak, & Borysevich, 2023).

In our opinion, the following risks and disadvantages arising in connection with the implementation of participation budgets in war conditions should be taken into account:

- due to the reduction in the amount of participation budgets, there is a reduction in project funding, which threatens the possibility of their implementation;
- in case of "freezing" of a project, difficulties arise in resuming the organization of the voting process for the continuation of this project and its victory, as well as bringing this project to its logical conclusion;
- funds for implementing projects are allocated for the year following the vote. Given the change in the priority of projects in war conditions during this period, the project may lose its relevance;
- funds for the project implementation are received not by the initiators but by public utilities under city councils. In addition, utilities themselves establish the order and regularity of funding, which, due to war, may increase the risks of project suspension.

To effectively further develop the participation budget in the face of new challenges, it is advisable to take into account not only the shortcomings and risks existing in Ukraine but also to use the experience of other countries involved in the development of the local finance system and the implementation of the public budget. The international practice of using participatory budgeting shows that the active action of non-governmental organizations and other public associations and constant public monitoring plays an important role.

Gender-responsive budgeting is an effective tool to help develop fair and effective budgets that address the real needs of men and women and groups of people with different and special needs. Its purpose is to plan budget funds considering the characteristics and needs of specific gender groups of people**.**

The result is the rational use of funds with maximum consideration of gender needs. It is implemented in Ukraine and developed countries (Iceland, Sweden, Norway).

The advantage of the practice is cost optimization, and the disadvantage is the need for special training for application.

Today, there is no single generally accepted effective model of a gender-oriented approach to budgeting since different countries have their own specific socio-economic and political-cultural conditions. Therefore, a gender-responsive approach to budgeting must be tailored to each state individually (Karpych & Miedviedkova, 2021).

Gender-responsive budgeting and participation in the budget process are critical to achieving gender equality and empowering women and men. By incorporating a gender perspective into the budget process and including women and other marginalized groups in decision-making, the budget will reflect the needs and priorities of all citizens. This will help reduce gender gaps and increase opportunities for citizens to participate in society fully. That is why the practice of using gender-oriented budgeting is becoming increasingly widespread in the world (Lyutiy, 2023).

Features of ensuring budget transparency and publicity in war conditions

Our country's experience under martial law indicates that local self-government can be not only a driver of democratic transformations throughout society but also a powerful force for defense and resistance to Russian military aggression. It is relevant and progressive today when there is an awareness of the real threats and consequences of wartime and an understanding of the need to transform financial relations towards adapting the budget system to martial law conditions.

Expanding the resource base and transferring responsibilities, rights, and financial resources to the local level can provide the necessary steps toward victory, support regional recovery and reconstruction, and improve the well-being of all members of the territorial society.

The question arises whether it is worth thinking about the openness of budget data, general access to budget statistics, and reports of local authorities; when Ukraine experiences missile attacks from an aggressor country, citizens of Ukraine die every day, the housing of ordinary people, infrastructure facilities, and transport logistics are destroyed.

Budget transparency and publicity are the most important factors in the democratic development of any state. At the same time, the question that worries the scientific community, government officials, public organizations, and members of society remains insufficiently studied: is it worth taking measures to ensure budget transparency and publicity in a warring country repelling military aggression? There is a state of emergency in the country, the war continues, and now it is difficult to foresee the timing of its end.

The answer is obvious. During the war, there is a need to maintain state secrets and ensure national security, which may limit access to information about budget operations, including local budgets. The basic principle of budget transparency and publicity in war conditions should be "no harm." We are not discussing the secrecy of information about "secret expenses." The content and procedure for financing, which was from the state budget, were well worked out even before the war.

This refers to all expenses of military significance at the local level, information about which, if transparent and open, can be analyzed by the enemy and used not in favor of the integrity of our country. In this regard, it is important to clearly define the list and types of information materials regarding local budgets that should not be made public.

At the same time, during the war, the interest of society members in a more transparent and efficient use of budget funds increased. The war increased the demand for openness and publicity of information about the activities of local authorities to prevent corruption. Today, ensuring its permanent control and audit is becoming especially relevant. Under martial law, transparency and publicity of the budget means money and control over the proper use of funds and lives saved. Thanks to open information, citizens can check whether funds have been allocated for the restoration and repair of housing, whether bomb shelters have been built, and whether the amounts allocated for relevant projects are realistic and not inflated. Budget transparency allows citizens to feel like full consumers of the maximum level of public services in exchange for their tax payments.

Without attracting charitable assistance from foreign governments, as well as their local authorities, in particular sister cities, and international financial organizations, it would be impossible to overcome the shortage of funds for investment in the process of restoration, rehabilitation, and development of communities and territories. Donors of local budgets have become active stakeholders who want to know how the funds they provide are used; they are interested in open information about the directions, intended use, and efficiency of using budget funds. The assistance of Western partners depends on budget transparency.

In our opinion, determining the features of ensuring budget transparency and publicity in war conditions at the level of local budgets involves taking into account the following factors:

– *status of the community and region.* After the outbreak of war, they can be divided into those under occupation, de-occupied, temporarily occupied, and not occupied. The capacity of many communities and the situation in the communities themselves have changed, and front-line communities have also emerged; communities that have suffered human losses, losses of housing, land, property, and income, problems of depopulated territories have arisen, difficulties in restoring public authority in de-occupied territories;
– *the presence of important military strategic facilities and critical infrastructure facilities in a specific region or territory;*
– *the results of the review of interbudgetary relations, in particular, a list of local authorities' own and delegated powers, as well as a certain simplification of the procedure for coordinating decisions between state and local authorities;*
– *the emergence of a new management level - military administrations.* Thus, the list of participants in the budget process under martial law, in addition to the relevant local government bodies and local self-government bodies, also includes military-civil administrations or military administrations that approve local budgets drawn up by local financial authorities without the approval of the relevant commission to the local to the council, transfer of budget assignments from one main manager of budget funds to another, redistribution of budget expenditures and provision of loans from the budget for budget programs, including the budget reserve fund, additional subsidies and subventions, within the total volume of budget assignments of the main manager of budget funds, as well as an increase in expenses development by reducing other expenses by the budget program;

– *requirements and challenges of European integration.* Due to Russia's full-scale invasion of Ukraine, the President of Ukraine declared martial law on February 24, 2022. With the participation of local government bodies, the military command, together with military administrations, executive authorities, and law enforcement agencies, had to introduce and implement the measures of the legal regime of martial law provided for by the Law of Ukraine "On the Legal Regime of Martial Law,"(Law No. 389-VIII, 2015) implement the powers necessary to prevent the threat and repel armed aggression and ensuring national security, eliminating the threat to the state independence of Ukraine, its territorial integrity.

Thus, regional, Kyiv city state administrations and local governments have to create defense councils and assist the military command in introducing and implementing measures of the legal regime of martial law. In connection with the introduction of martial law, the Verkhovna Rada of Ukraine changed the Budget Code of Ukraine (Budget code No. 2456-VI, 2010) by the Law of Ukraine dated March 15, 2022 No. 2134 (Law No. 2134-IX, 2022).

Let us determine the main factors that influenced budget transparency and publicity against the backdrop of the transformation of various areas of interbudgetary relations in Ukraine during the war, respectively, in particular, by the amendments made to Section VI, "Final and Transitional Provisions" of the Budget Code of Ukraine and other legislative acts of Ukraine (table 3).

Table 3.
Features of ensuring budget transparency and publicity during the war in Ukraine

Main areas of ensuring budget transparency and publicity:	***Factors that influenced budget transparency and publicity during the war in Ukraine*** (Decree of the President of Ukraine No. 64/2022, 2022), (Law of Ukraine No. 2134-IX, 2022).
in the sphere of formation of budget revenues (tax revenues)	Article 75-1 of the Budget Code and related norms for local budget forecasts do not apply; local state administrations, military-civil administrations, or military administrations (if they are formed) may decide to transfer funds from a special fund of the local budget (except for the own revenues of budgetary institutions and inter-budgetary transfers) to the general fund of the local budget. In case of transfer of funds from the special fund of the local budget to the general fund of the local budget, as an exception to the provisions of Article 72 of this Code, the local budget may be approved with a surplus for the special fund and with a deficit for the general fund by amending the decision on the local budget.
in the field of budget expenditures	Article 23 on the mandatory approval by the relevant commission of the Verkhovna Rada of the Autonomous Republic of Crimea, the local council of the decision of the Council of Ministers of the Autonomous Republic of Crimea, the local state administration, the executive committee of the relevant local council on the redistribution of budget expenditures and the transfer of budget assignments does not apply; local state administrations, military-civil administrations, or military administrations (if they are formed) may make decisions on the implementation as an exception to the provisions of part two of Article 85 of the Budget Code (transfer by the state of the right to carry out expenses), expenses not included in the relevant local budgets by this Code, and the costs of maintaining budgetary institutions simultaneously from different budgets. Such expenses are carried out by providing an interbudgetary transfer from the local budget.
in the field of inter-budgetary transfers	Part six of Article 108 on the mandatory agreement with the Verkhovna Rada of Ukraine Committee on the Budget of decisions of the Cabinet of Ministers of Ukraine on the distribution and redistribution of amounts of subventions and additional subsidies from the state budget to local budgets between local budgets does not apply; Local governments or military administrations may decide to transfer funds from local budgets to the state budget, meeting the food needs of the civilian population, evacuation/removal/relocation the civilian population from areas where hostilities are taking place and dangerous territories to safe places, including payment for transport services, fuel, and lubricants, arrangement of accommodation for citizens in communication with hostilities, they left their place of residence/stay, payment for other measures aimed at supporting the civilian population under martial law; Local governments or military administrations may decide to transfer funds from local budgets to the state budget.

	Parts seven and eight of Article 78 do not apply in terms of restrictions in decision-making by the Verkhovna Rada of the Autonomous Republic of Crimea, the relevant local council on amendments to local budgets; The Cabinet of Ministers of Ukraine can decide on the specifics of the formation and execution of local budgets and the activities of participants in the budget process in the relevant territories.
in organizing the budget process at the local level	According to paragraph 1. Part 3 of Art. 15 of the Law of Ukraine "On the legal regime of martial law," district and regional military administrations, formed in connection with the failure to convene a session of the district and regional council, respectively, within the time limits established by the Law of Ukraine "On Local Self-Government in Ukraine", exercise the powers to create and approve, respectively, district, regional budgets, making changes to them, approving reports on their execution; distribution of funds transferred from the state budget in the form of subsidies, subventions, respectively, between district budgets, local budgets of cities of regional significance, villages, towns, cities of district significance.
in the field of budget lending	Article 23 on the mandatory approval by the relevant commission of the Verkhovna Rada of the Autonomous Republic of Crimea, the local council of the decision of the Council of Ministers of the Autonomous Republic of Crimea, the local state administration, the executive committee of the relevant local council on the provision of loans from the budget does not apply.
in the field of borrowing	establish that during the period of martial law and within six months after its termination or cancellation in the event of an overdue debt of an enterprise to the Autonomous Republic of Crimea, regional council, or city territorial community on a loan (loan) attracted by the Autonomous Republic of Crimea, regional council or city territorial community or under a state (local) guarantee, as well as for a loan from the budget, penalties and other penalties are not charged. Regional and city councils are given the right to carry out new local borrowings and provide local guarantees, even if in the process of making payments to repay and service the local debt, the payment schedule is violated, penalties are assessed, and overdue debt has arisen.
reporting deadlines	the norm as Article 80 regarding compliance with the deadlines for submitting reports on the execution of local budgets does not apply

Conclusions

Local authorities must focus on priorities: winning, producing weapons and ammunition, supporting businesses, and developing the local economy.

Recovery should become a therapy for our society, including improvement, modeling, and strengthening the financial viability of communities on the principles of joint state building, people-centrism, and involving citizens in decision-making.

Continuing decentralization reform provides new opportunities for Ukraine. Decentralization should be seen as a necessary reform to promote effective and transparent governance at the community level.

Main tasks and reforms:

1. *Creation of an effective system of local self-government that will meet the needs of citizens and contribute to the development of communities*;
2. *Decentralization of powers and resources from central government to local government*;
3. *Increasing the financial viability of communities*.
4. *Ensuring transparency and accountability of local government. Local authorities must be transparent and accountable to citizens*. To do this, it is necessary to introduce mechanisms of transparency and accountability of local authorities, in particular through holding local elections, ensuring access to information about the activities of local authorities, and creating public control mechanisms.

So, a transparent community is one of the key factors for the success of decentralization reforms to ensure community development and improve citizens' quality of life. It is necessary to create a Register of decisions of local government bodies.

Ensuring budget transparency and publicity during war includes the following steps:

1. *Digitalization and transparency: focuses on the role of digitalization in achieving transparency and involving citizens in management decisions.*
2. *Dream Digital Ecosystem: Introduces the Dream Digital Recovery Management*

Ecosystem, now actively deployed in more than 150 communities.

3. *Openness and transparency in management: emphasizes openness in the processes of project selection, decision-making, and project implementation.*
4. *System for monitoring and evaluating the development of regions: promises to introduce a system for monitoring and evaluating the development of regions and communities to manage their implementation effectively.*
5. *Municipal statistics and administrative supervision: develop a bill on municipal statistics and administrative supervision over the legality of decisions of local governments.*
6. *Electronic democracy: Rethinking the role of people.* Amid these transformations, the concept of e-democracy is taking center stage. Although it was not intuitive initially, it proved to be a revolutionary strategy for engaging citizens. E-democracy seeks to activate citizens by involving them in decision-making processes. This includes forming project teams, proposing ideas, participating in project discussions, and prioritizing initiatives through direct voting and surveys.
7. *Activation of citizens through electronic democracy. Integrating e-democracy into the recovery process serves as a dynamic tool for civic participation.* Citizens are not simply passive recipients of policies; they become active participants in the development program. Through digital platforms, people can express their opinions, propose solutions, and directly influence the trajectory of projects, which promotes a sense of ownership and empowerment.

Several steps make it possible to bring transparency and publicity closer to European practices; in particular, the involvement of local authorities in the *digitalization* of the budget process has proven effective, with a focus on transparency, accountability, and the ability to involve residents in the development and adoption of decisions.

For this purpose, they are also launching a digital ecosystem for managing the restoration of Dream, in which more than 150 communities are already actively working; by the end of the year, a system for monitoring and assessing the development of regions and territorial communities will also be presented, which will contain indicators of socio-economic development.

Thanks to this system, it is possible to digitize strategies at different levels. By the end of the year, a system for monitoring and assessing the development of regions and territorial communities containing indicators of socio-economic development will be presented.

The implementation of the system is the first step towards the introduction of municipal statistics in Ukraine. It will help communities and the government receive and analyse current information for making management decisions. Several legislative initiatives will also be presented that are important for completing the decentralization reform; the absolute priority is bill 4298, which should provide administrative oversight over the legality of local governments' decisions.

International partners are ready to cooperate with the central authorities of Ukraine and local authorities to ensure transparency and accountability of local authorities. In turn, a transparent and integrated community provides the following opportunities:

– ensuring the legitimacy of decisions, multi-level management, involvement of territorial communities in the formation of national and regional policies, and, certainly, monitoring and combating corruption;
– strengthen and give tools to decoupled communities to restore local self-government, conduct municipal statistics, and provide digital tools for planning and forming projects;
– focus your support on reforms that contribute to the creation of transparent and effective government structures;
– involving citizens in management decisions and strengthening the institutional capacity of local government associations are also key elements of success.

The Association Agreement between Ukraine and the EU is an important step in developing our state since the use of the experience of EU member states allows us to reform the current state of public finances. The process of reforming public finances to EU requirements will not only put public finance indicators in order but will also ensure the creation of favourable conditions for enhancing business activity, increasing the level of social security in the country, and attracting investment into the country.

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Consistency of quality management contours for the development of industrial enterprises on the basis of target contour planning

Узгодженість контурів управління якістю розвитку промислових підприємств на основі планування цільового контуру

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Abstract

To solve the problem of the qualitative development of industrial enterprises, which lies in the inconsistency of the contours of the quality of the development of the scientific task. The article proposes a methodical approach to the planning of the consistency of the contours of the quality management of the development of industrial enterprises based on the planning of the target contour based on the three-level system model and the means of multifactor modeling, the use of which will allow the management of the industrial enterprise to monitor the state of achievement/failure to achieve the planned development goals and timely identify the cause of this phenomenon during the normal process of management coordination, destabilization and recovery.

Анотація

Для вирішення проблеми якісного розвитку промислових підприємств, яка полягає в невідповідності контурів якості розробки науковому завданню. У статті запропоновано методичний підхід до планування узгодженості контурів управління якістю розвитку промислових підприємств на основі планування цільового контуру на основі трирівневої системної моделі та засобів багатофакторного моделювання, використання яких дозволить керівництву промислового підприємства здійснювати моніторинг стану досягнення/невиконання досягнення запланованих цілей розвитку та своєчасне виявлення причини цього явища під час нормального процесу координації управління, дестабілізації та відновлення.

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As a result of modeling and simulation experiments, a bank of levels of operations for various purposes and source data is obtained. The obtained sets of action sequences can be used as "road maps" in case of a real critical situation.
The proposed approach can be used to develop options for future plans for qualitative development of the enterprise by setting a target situation for a certain future moment in time and finding a sequence of intermediate situations of qualitative development of the enterprise, which leads to setting a goal.

Keywords: planning, contours of development, quality of development, enterprises.

В результаті моделювання та імітаційних експериментів отримано банк рівнів операцій різного призначення та вихідних даних. Отримані набори послідовностей дій можна використовувати як «дорожні карти» у випадку реальної критичної ситуації.
Запропонований підхід може бути використаний для розробки варіантів перспективних планів якісного розвитку підприємства шляхом постановки цільової ситуації на певний майбутній момент часу та знаходження послідовності проміжних ситуацій якісного розвитку підприємства, що призводить до постановки мети.

Ключові слова: планування, контури розвитку, якість розвитку, підприємства.

Introduction

To ensure high-quality development of production, radical changes are needed not only in the technological policy of the enterprise, but also in the very ideology of strategic transformations. Among the main problems on the way to achieving high-quality development of production, it is customary to single out insufficient financial, material, technical and personnel support. However, the complete or partial lack of sufficient provision of production development does not explain the fact that at industrial enterprises where such a problem does not exist, the achieved level of production development can be called qualitative. Situations often occur when the enterprise has resources, set development goals and objectives, but there is no time to implement the planned initiatives or the moment is unfavorable. On the contrary, the time is favorable for development (which involves obtaining additional advantages due to the timely response of the enterprise to the needs of the external environment), but the enterprise lacks resources. Thus, the root of the problem is hidden in the inconsistency of such contours of development quality management as:time (necessary to perform the assigned tasks);goal;resources (necessary expenses).

A solution to the scientific problem of planning the consistency of quality management contours of the development of industrial enterprises, namely the consistency of the target contour with time and resources by using multifactor modeling tools and the simultaneous use of the advantages of simulation experiments, is proposed.

The expediency and necessity of planning the target contour of the enterprise's qualitative development is explained by the need to develop options for prospective development plans by setting a target situation for a certain future period of time and forming the necessary amount of resource support. That is, the process of planning the strategic goals of enterprise development cannot be separated from such important components as time (time contour) and resources (resource contour). Only that goal has a high chance of being achieved, which was set in a timely manner and its achievement was resource-based.

Based on the results of the study, it was possible to work out options for future plans for qualitative development of the enterprise by setting a target situation for a certain future moment in time and finding a sequence of intermediate situations of qualitative development of the enterprise, which leads to the set goal.

On the basis of the analysis of existing concepts regarding the planning of goals, the time required for the performance of tasks, and resources (chapter "Theoretical foundations or review of the literature", in the chapter "Methodology" an approach to planning the coherence of the contours of quality management of the development of industrial enterprises is proposed on the basis of the planning of the target outline based on the model of the three-level system and multifactor modeling tools for the development of options for future plans for the qualitative development of the enterprise.

In the section "Results and discussion" the results of simulation modeling of consistency of the target contour with time and resource are presented. A bank of transaction levels for different purposes and output data is obtained. The resulting sets of action sequences can be used as "road maps" in the event of a real critical situation.

Theoretical framework or literature review

To understand the process of achieving high-quality development of the enterprise, the concept of "contours of the quality of development: time, resources, goal" is proposed.

In management, it is customary to distinguish "control loops", which are understood as a closed chain of links of the control system, in which the subject and the object of control are connected using direct and feedback communication, for example: the loop of economic planning, the loop of controlling, etc. Daniel, Pierre A.; Daniel, Carole (2018). Also, management contours determine the general direction of the organization, its divisions, and individual employees Holmes & Leonard (2012).

Thus, a contour should be understood as a given direction and sequence of actions. In the work, the given direction is the achievement of the quality of the development of the enterprise.

Susan Antler, Leslie Cooperband, Craig S. Coker, Mary Schwarz, Robert Rynk (2022) Argued that enterprise planning involves a series of steps that include resource analysis; assessment of the company's strengths and weaknesses, opportunities and threats; thoughtful development of the company's vision and mission; goal setting; and assessment of business and financial options.

Xiuhua Shi, Fei Zhou, Zhe Wang, (2021) propose to improve the adaptability of situational analysis to supplement the technical basis of planning management.

Godwin Banafo Akrong, Yunfei Shao, Ebenezer Owusu (2022) highlight that large enterprises and governments increasingly rely on planning systems.

Emanuel João Martins, Fernando Paulo Belfo (2023) believe that one of the best ways to optimize business processes is to implement an enterprise resource planning system.

In the critical period of the digital reform of the enterprise, the market interaction between the enterprise resource planning system (ERP) and the production management system (MES), which is an important way for the development of industrial enterprises. The performance of the new model Zheng-Xin Wang, Yue-Qi Jv, Ze-Dong Wang, Ji-Huan Ma (2023) confirmed its significant prediction accuracy and significantly increased reliability.

Muhmmad I. Nofal, Zawiyah M. Yusof (2013), even a decade ago, suggested more attention should be paid to the integration of business intelligence and enterprise resource planning (BIERP).

Forecasting the time contour of the quality of the development of industrial enterprises based on certain components (dynamics of changes in technological structures in the country’s economy; acceptance or rejection of a new product by the market due to changes in technological conditions; the speed of advancement of new technologies at industrial enterprises) makes it possible to achieve the smallest time interval between the emergence of the need for external environment and its satisfaction from the enterprise (Hroznyi, 2014).

A study by Zeyu Wang, Yue Deng, Shouan Zhou, Zhongbang Wu (2023) proposes goals for achieving enterprise development and applies a framework of recommendations for decision-making and resource optimization of entrepreneurial projects for sustainable socio-economic development.

Hroznyi I. (2014) believes that the achievement of a coherent state of consistency of quality management contours can be implemented through the determination of the necessary quantity and quality of resources.

Therefore, it can be concluded that despite the popularity of the planning of individual contours of development quality management, there are no studies that would consider the peculiarities of the coherence of such contours based on the planning of the target contour. Management of the quality of the development of an industrial enterprise involves the use of a set of methods of planning and forecasting the coherence of the contours of the management of the quality of development.

Methodology

The management of the time contour of development sets before the enterprise the task of forecasting a favorable moment for the structural restructuring of the production process at the industrial enterprise in accordance with the needs of scientific and technological progress, which leads to the achievement of qualitative development of production and satisfaction of consumer needs in the shortest possible time. That is, the time contour of the development of production should be understood as a specific time range in which the necessary measures are carried out or not carried out within the framework of the implementation of the development strategy.

The state of the external environment in relation to the enterprise can be favorable, unfavorable or neutral (Tarasova et al., 2021).

According to the results of forecasting the quality management time contour of the industrial enterprise development and determining the favorable moment for the realization of the intended goals and objectives, special attention should be paid to the resource provision of this process, because the level of balance between the time and target contours will depend on the planning of the resource management quality contour of the enterprise development. The resource contour of production development consists of a set of listed resources and their components. Ideally, in order to achieve a high level of production development quality, all components of the resource circuit should be in equilibrium, i.e., the quality and quantity of material resources corresponds to the level of development of the technology used in production thanks to the use of qualified labor and is within the limits of the financing of the production development program.

The target contour of the management of the quality of the development of the enterprise represents the directions along which the financial and economic activity of the enterprise should be carried out. This is a qualitative characteristic of goals. On the other hand, the goal should define the desired state of the system, which should be achieved after a certain period of time, necessary to obtain a certain quantitative and qualitative assessment.

The analysis of the goals of the enterprise as a system in various aspects makes it possible to distinguish the following types of system views: microscopic, functional, macroscopic, hierarchical and procedural (Hroznyi, 2014).

In this article, the concept of structure should be counted among the topological characteristics of the system of goals, i.e. it fixes the location of elements and links in this system.
For example, in the structural diagrams of organizational systems, we will consider the center, active elements, etc. - creative, and the lines that connect them - real material and informational connections between goals.

To date, (Hroznyi et al., 2018), that in the mathematical theory of active systems, management tasks were set, an optimal plan was agreed upon, taking into account the interests of the system as a whole and the interests of the creators. The development of these ideas takes place within the framework of the theory of active systems, information theory of hierarchical systems. However, in many important practical cases, these theories lack accurate ideas about the structures in specific cases, their possible transformation in various environmental conditions, and the resolution of contradictions in the relationship between the constituent goals.

Enterprise development goals are multi-layered (Fobel & Kuzior, 2019). They form a hierarchy analogous to a planning system, i.e. the system of goals is the outline of the plan. Each structural unit of the enterprise must have and has a certain development goal, therefore the formulation of the goals of the strategic plan is successful in many respects when a balance is achieved between the goals of the organization, the necessary amount of resources for their achievement and a favorable time range for their implementation. (Hroznyi et al., 2014).

Thus, the use of a methodical approach to the planning of the consistency of the contours of quality management of the development of industrial enterprises based on the planning of the target contour should solve the following tasks:

1. Achieving a balance between time and resource contours of qualitative development of the enterprise.
2. Development of a mathematical toolkit, the use of which will enable the management of the enterprise to monitor the state of achievement/failure to achieve the planned goals and timely identify the cause of this phenomenon.

A number of factors (concepts) are characteristic for solving the tasks, the most important of which are the following:

goals that determine the direction of system development on a given modeling time horizon;
actions (operations) leading to the achievement of goals;
indicators reflecting the state of the system.

To solve the tasks, it is proposed to use formal multifactor modeling based on a three-level system consisting of graphs of goals, operations and indicators that interact.

The development of a methodical approach to the planning of the consistency of the contours of the quality management of the development of industrial enterprises based on the planning of the target contour based on the model of the three-level system includes the following stages:

1. Development of a basic model of the interaction of goals, operations and indicators in all possible states of coherence between development contours (state of stability, destabilization, recovery).
2. Analysis of the properties of the components of the three-level system: attainability of states at the level of operations and stability of transient processes of mutual influence of indicators on the state of achievement/failure to achieve the set goal.
3. Introduction of a component into the model that reflects the mutual influence of deviations of indicators from the norm (deviations) of the state of consistency between contours.

Cause-and-effect relationships are set on sets of goals, operations, and indicators, which are reflected by the corresponding levels. The goals of the system form a hierarchy in which the main (global) goal and intermediate goals - milestones on the way to the main one - are distinguished. The level of goals models the order of achievement of goals: from lower to higher. The operations layer models a flow of operations that can be executed both sequentially and in parallel. The level of indicators models the mutual influence of indicators.

The level of operations is modeled by a Petri net, the positions of which correspond to the operations of the implemented process, transitions to the events of the change of operations. Each position of the operations level corresponds to a Boolean variable $p_i \in \{0,1\}$:the operation is performed if $p_i = 1$, andnot executed if $p_i = 0$. Transitions, in turn, are "loaded" with decisive conditions - logical functions from variables: time, values of indicators (or deviations of indicators from the norm), indicators of goal achievement. These logical functions must ensure the network's dynamism and determinism.

The level of goals is an acyclic Petri net, where positions correspond to goals, transitions reflect the achievement of higher goals as a result of the achievement of lower ones. Each goal level position corresponds to a Boolean variable

$g_j \in \{0,1\}$,the goal is achieved if $g_j = 1$,

and not reached if $g_j = 0$.

An indicator level is an oriented level, the vertices of which are mapped by indicators. Transitions between levels reflect the mutual influence of indicators and are loaded with functions that transform their change. The vertices of the indicator level correspond to variables that acquire values from a set of real numbers

$$m_k \in R .$$

The diagram of the interaction of the blocks of the three-level system is shown in Figure 1, where the upper rectangle corresponds to a fragment of the level of goals, the middle one to a fragment of the level of operations, and the lower one to a fragment of the level of indicators.

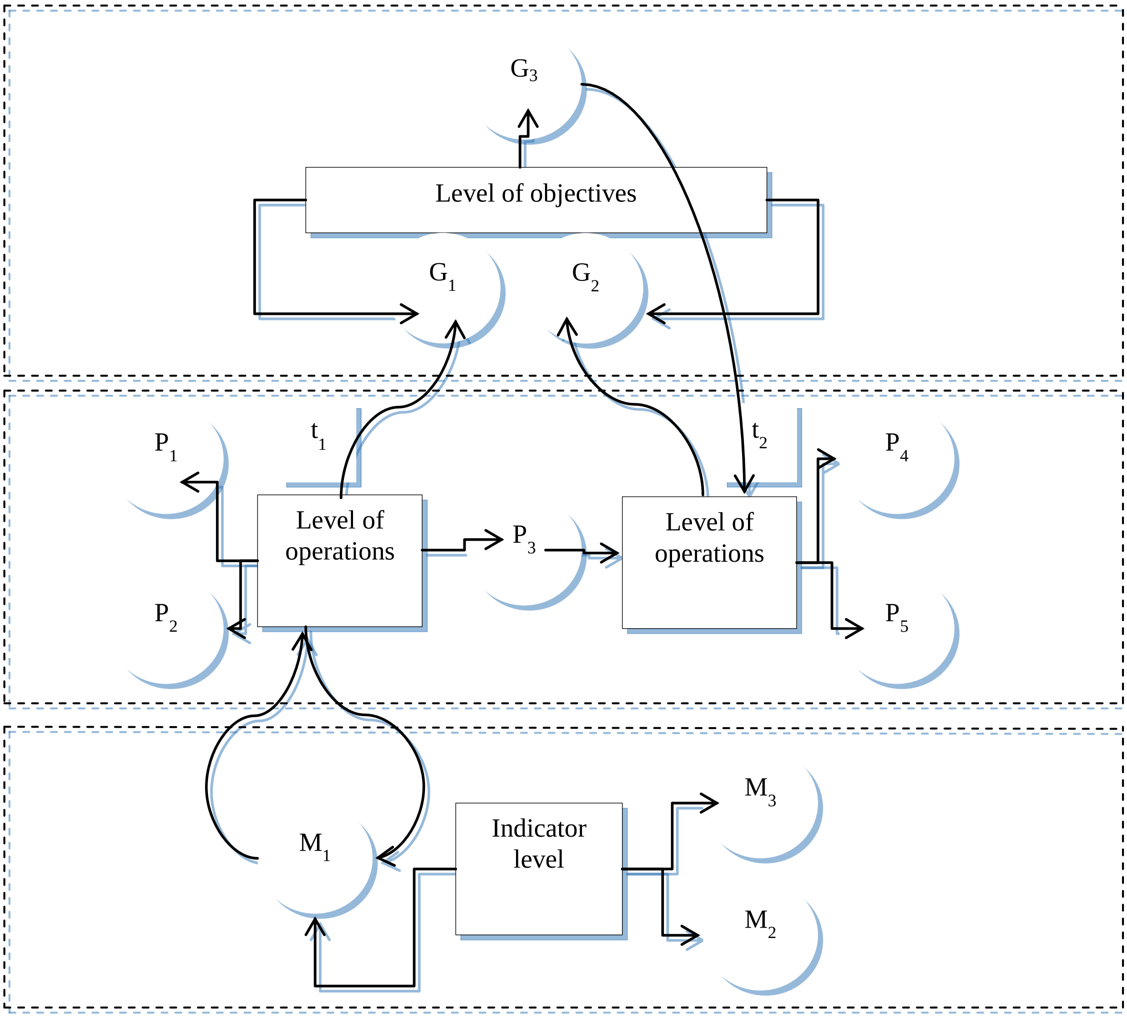

Figure 1. Scheme of interaction of the components of the three-level system.
Source: own research.

The process of managing the quality of the enterprise's development is modeled on two time scales - the operational one $\tau = 0,1,...h$ and indicator $\theta - 0,1,...,H, H \geq h$.

Intervals $[\tau_{i-1}, \tau_i), i = 1,...h$ are called operating cycles characterized by a subset of achieved goals G_i, where $G_i \subseteq G, G_{i-1} \subseteq G_i$ (G – set of all targets).

This means the following: if any goal is achieved during the simulation on the time horizon, then it remains achieved until the end point of the horizon, P_i –sets of operations, $P_{iq}, q = 1,2,...$ – vectors of indicator values characterizing operating cycles.

The qualitative development of the enterprise is reflected by the cyclic repetition of the sequences of the stages of the states of agreement (balance) between three contours: target, resource and time. The state of agreement can be: normal (acceptable), unstable and in the process of restoring the agreement density. Each of these states is characterized by the functioning of the levels of goals, operations, indicators and the interaction between them are shown in Figure 2.

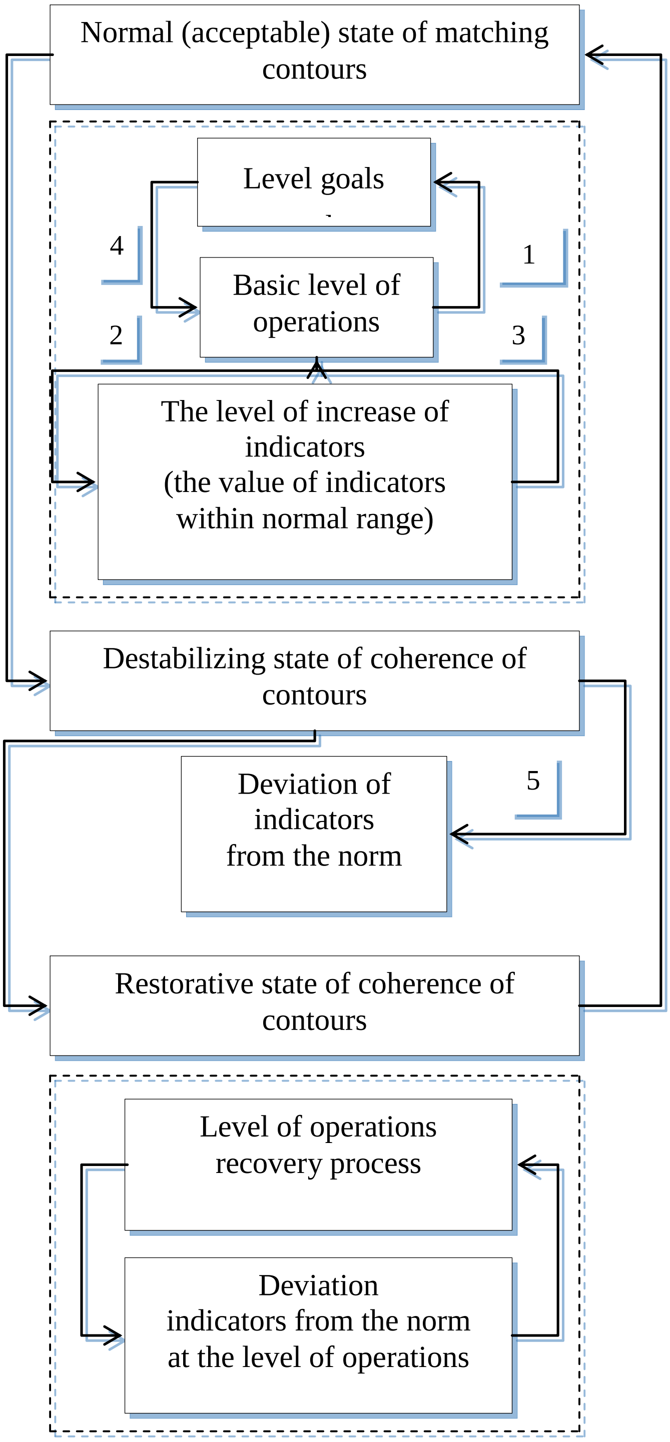

Figure 2. States of consistency (balance) between contours in the management processquality of enterprise development.
Source: own research.

For the period when the contours are in a normal state of consistency with each other, the level of indicators is modeled using a weighted sign increment level. The dynamics of the change of indicators in this model is determined by the formula

$$r_i(\theta+1) = r_i(\theta) + \sum_{G_i} \Delta r_j(\theta)\omega_{ji}, \quad (1)$$

where $r_i(\theta)$ –the value of the indicator at the moment of time θ, G_i;

$\Delta r_j(\theta) = r_j(\theta) - r_j(\theta-1)$ –increase of the indicator for the previous cycle;

ω_{ji} – indicator weight.

1. The interaction of levels is reflected by loaded (decisive conditions) leading from transitions between levels of operations to the top of goals and indicators. Feedback from these levels to the level of operations is revealed through the permissive conditions that load its transitions (Tupkalo, 2020).

The basic level of operations is the coordinator of the functioning of the modeled system during the normal state of coordination between circuits.

As a result of triggering its transition t_i:

upon fulfillment of the conditions leading to t_i in certain positions c_q goal level, goal achievement is modeled c_q (arrow 1 in Figure 2). At the level of goals, a transitional process is launched, which ends (due to the acyclicity of the level of goals) with the establishment of equilibrium between contours;
guiding influences on the level of indicators are presented, which cause a jump-like change in their values (arrow 2 in Figure 2) and, as a result, a transitional process in the level of indicators, during which the vector of indicator values changes. The number of steps of this process can be estimated from above by the value ξ.

Let's assume that the transition t_i converted the level of operations into marking (state) D_j ,in which transitions are activated (can work). $t_{ji,}...t_{je}$, loaded and triggered by boolean functions $f_{ji},...f_{je}$. Two alternative results of the process at the level of indicators are possible (arrow 3 in Figure 2):

1. Any of the functions will acquire the value 1 $f_{ji},...f_{je}$ i, as a result, the corresponding transition at the evel of operations will be triggered, leading to the following marking.
2. The estimate will be reached and the simulation experiment on the three-level model will stop.

Another reason for stopping modeling is the achievement of all set goals (arrow 4 in Figure 2).

The destabilization of coordination between the contours of the quality management of the enterprise's development is caused by external influence (arrow 5 in Figure 2) or critical accumulation of internal changes in the system. This is expressed in the deviation from the norm of some indicators, which, due to the presence of cause-and-effect relationships, initiate the deviation of other indicators, etc. An uncontrolled process of the spread of deviations, characteristic of a crisis situation, is launched.

The introduction of deviations in the model of the quality management cycle of the enterprise development is explained by the fact that its application makes it possible to increase the adequacy of the modeling (due to the loading of linear functions) and facilitates the expert's understanding of the processes implemented in the system (crisis situations are usually perceived in terms of deviations of indicators from norms) (Hroznyi, Kuzmak & Rusinova, 2018).

For the period of the normal state of coherence between the contours, the model in Fig. 2 is three-component, and destabilization is reflected by a one-component model. A two-component model consisting of deviations that interact with each other and a special level of recovery operations corresponds to the recovery period of coherence between the contours. The goal of the recovery process is standard: bringing indicators back to normal, so there is no level of goals in this structure. The level of restorative operations controls deviations of indicators (arrow 6 in Figure 2) and gradually brings them to zero (close to zero) value

Results and discusión

The following actions are performed during the simulation modeling of the consistency of the target contour with the time and resource contour.

For the period of the normal state of consistency between contours:

1. The achievement of the goals is checked on the given modeling time horizon. If all the goals are achieved, then the moment of achievement is indicated. If not, then the place and moment of "hanging" between the levels of operations and goals is recorded.

2. Time changes of the values of the system indicators for the period of the normal state are built.

For the destabilizing process of matching between contours:

1. If the destabilization process comes to equilibrium before the end of the specified control period, then the moment of establishing equilibrium and the final deviations of the indicators from the norm are fixed.

If it does not come, then the simulation is interrupted either by time or in case of critical deviations of the indicators. The moment (tact) at which the rebuilding process is started is selected and the initial deviations of indicators for this process are set.

2. Time graphs reflecting the dynamics of the destabilization process are built.

For the restoring process of coherence between contours:

1. The expert sets the value of the guiding influences of the transitions of the restorative level of operations according to deviation indicators and, on this basis, conducts a simulation experiment on the normalization of indicators. If the specified number of indicators is normalized (number of indicators), then we return to the normal operation mode. Otherwise, we correct the governing influences and repeat the experiment.
2. Time graphs reflecting the dynamics of the restoration process are constructed for each experiment.

In the period of the normal state of consistency between the target, time and resource contours, the indicators of the system are characterized by their normal point estimates, in this period, with their combined influence on another indicator, we find the resulting change as the sum of the effects of each indicator, therefore, we believe that we are able to give an estimate of the change in the indicator from with a slight degree of uncertainty.

The degree of uncertainty in its assessment increases with the growth of the growth rate of the indicator. Finally, the point estimate of the indicator goes beyond the normal range, and the expert is no longer able to give an adequate assessment of it. In this case, the model of the mutual influence of indicators is replaced by a graph of deviations, in which the degree of deviation from this range is evaluated, not the point value of the indicator within the permissible range of values. At the same time, evaluating the joint influence of several indicators on one, it is difficult to assess the contribution of each of them.

Therefore, only those indicators that have the greatest impact are taken into account (taking into account the sign) (Kuzior, Kwilinski, & Hroznyi, 2021).

So, in the first step, the levels of mutual influence of indicators are constructed during the periods of the normal state of consistency between the contours and the period of the crisis situation, the range of normal values of each indicator of the system is selected for the period of normal operation, and the degrees of influence of the indicators on each other for the periods of destabilization/recovery are set.

In the second step, the level of goals for the period of the normal state of coherence is built. The level of goals for the recovery period degenerates to one goal: to bring all indicators to the norm (that is, to obtain an estimate of the deviation of indicators from the norm in the range from "very small negative" to "very small positive").

The goals set can be contradictory and alternative. Examples of graphical representations of alternative and conflicting goals left and right respectivelyare shown in Figure 3.

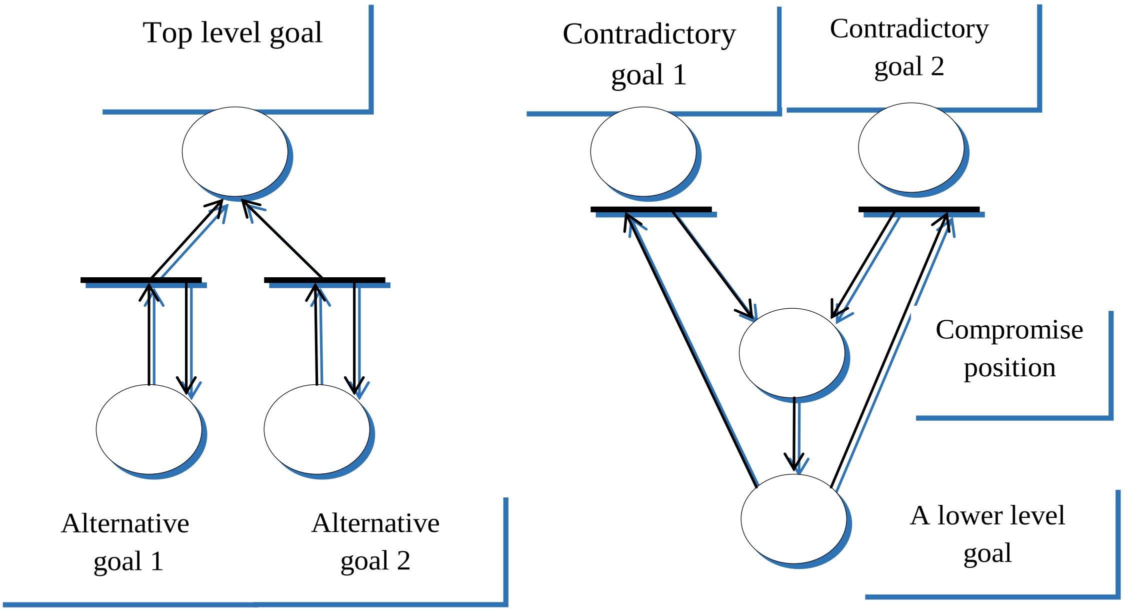

Figure 3. Examples of alternative (left) and conflicting (right) goals.
Source: own research.

Alternative goals are characterized by the fact that to achieve a higher-level goal, it will be enough to achieve any of them, which is shown in Figure 3. In the left column, when a marker is inserted into any of the lower-level goal positions, its output transition will be triggered, and the upper-level goal will be achieved.

Conflicting goals are characterized by the fact that the achievement of one of them excludes the achievement of the other, as shown in Figure 3 on the right. When a marker is placed in the "Lower Level Goal" position, one of its two output transitions will be triggered. At the same time, the marker will be transferred to only one of the upper level goals, and the second will remain unreached.

The level of goals makes it possible to present the hierarchy and decomposition of goals and tasks set before the system, to highlight milestones on the way to global goals. In the general case, the level of goals does not have to be binding, it can be a set of trees ("forest") (Repin & Eliferov, 2013).

In the third step, the level of operations is built, which manages the level of indicators and the level of goals.

Before compiling the level of operations, an expert analyst forms a set of actions necessary to achieve the qualitative development of the enterprise. For each operation, the following is determined:

– what goals does the operation lead to and on the basis of which criteria the goal can be considered achieved;
– which indicators are affected by the operation and in what way (changes its evaluation by some fixed value, sets its value, etc.).

After that, the analyst builds chains of their execution from these operations in accordance with his idea of the company's development strategy. For the period of the normal state of consistency between the contours of the qualitative development of the enterprise and the recovery process, their levels of interaction are built.

In the fourth step, connections between the levels of goals, operations and indicators are established. Thus a three-level system model is formed.

At the same time, it is advisable to apply the aggregate-module principle with the use as modules of typical fragments of the levels of goals, operations, indicators and the formation of appropriate libraries.

In the fifth step, the expert conducts simulation experiments on the three-level model, applying external influences to its inputs. Tables and graphs obtained during the experiment are taken into account in order to determine the effectiveness of the corresponding strategy of system development. These tables, in turn, can be combined into a graph-table model, which will display ribbons (sequences) of states on the levels - components of the three-level structure, as well as transitions leading to changes in these states.

The three-level structure functions in a "slow" (operational) tact, which corresponds to the triggering moments of transitions at the level of operations, in which management actions are formed at the level of goals and the level of indicators. The interval between adjacent moments on the scale, called the local modeling horizon, consists of steps due to the "fast" (indicative) tact. On the local horizon in the three-level system, the process of changing the values of indicators (during the period of stability) and deviations of indicators from the norm (during destabilization and recovery) is realized.

After carrying out a simulation experiment and receiving its results, the expert makes a decision about its effectiveness and, if necessary, makes amendments to the level of operations:

changes the composition and order of transactions;
changes functions at transitions between operations;
changes functions from the level of operations to the level of goals and indicators.

Next, the expert carries out a repeated simulation experiment with a new level of operations.

The process described above is repeated until the expert receives a level of operations that will satisfy him (taking into account the limitations of the external environment), or reaches the conclusion that the achievement of the set goals is impossible. In Figure 4 offers a general scheme of the modeling process.

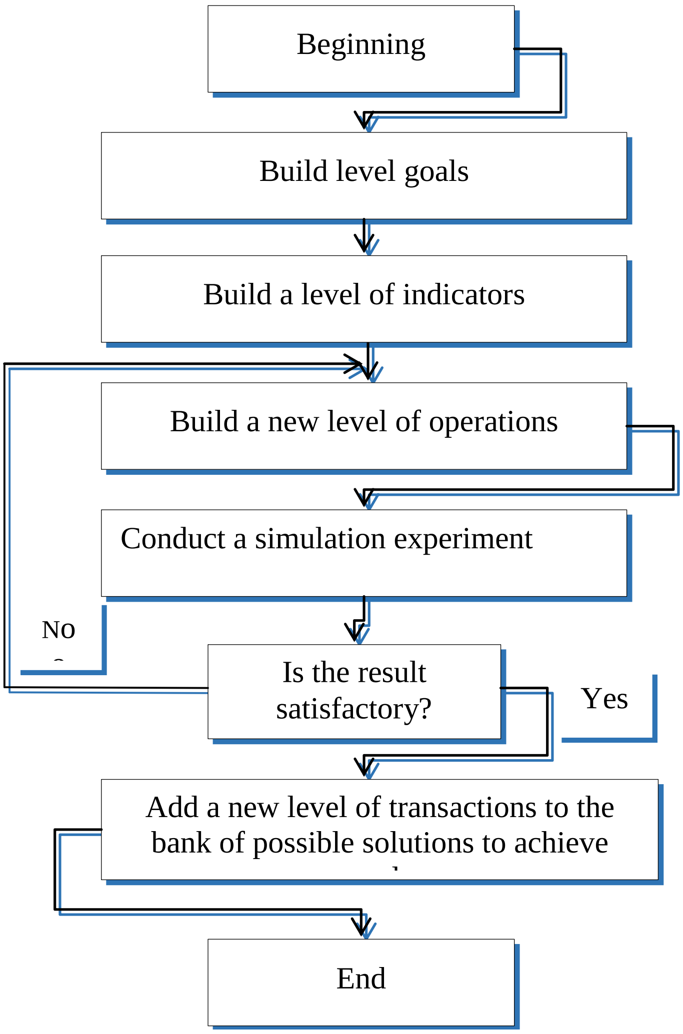

Figure 4. Schematic of the process of simulation of prospective target situations.
Source: own research.

After that, the expert can repeat the whole process again, specifying other initial values of the indicators for the period of normal (acceptable) consistency and deviations from the norm for the period of destabilization.

Thus, as a result of simulations and simulation experiments, a bank of levels of operations for various purposes and initial data is obtained. The obtained sets of sequences of actions can be used as "road maps" in the event of a real critical

Conclusions

Thus, achieving a state of consistency of quality management contours becomes real by determining the necessary quantity and quality of resources in accordance with the set goals of the enterprise's development in a favorable time period. For this purpose, a methodical approach to the planning of the consistency of quality management contours of the development of industrial enterprises is proposed based on the planning of the target contour based on the three-level system model and multifactor modeling tools, which involves the use of a set of planning methods and forecasting of the consistency of the quality management contours of development by reducing the gap between the selected contours, bringing them into a state of balance and unidirectionality with the aim of achieving consistency between inherently inconsistent management objects, which makes it possible to realize potential opportunities for development and increase the level of quality due to meeting the needs of the external environment in the shortest possible time.

When planning the target contour based on the three-level system model, the following stages are defined: development of the basic model of the mutual influence of goals, operations and indicators in states of stability, destabilization and recovery; analysis of the attainability of states at the level of operations and stability of transient processes of mutual influence of indicators on the state of achievement/failure to achieve the set goal; introduction into the model of a component that reflects the mutual influence of deviations of indicators from the norm (deviations) of the state of consistency between contours.

As a result of simulations and simulation experiments of the consistency of the target contour with time and resource, a bank of levels of operations for various purposes and initial data was obtained.

The proposed approach can be used to develop options for future plans for qualitative development of the enterprise by setting a target situation for a certain future moment in time and finding a sequence of intermediate situations of qualitative development of the enterprise that leads to the set goal.

Prospects for further research in the development of the topic consist in the development of approaches to forecasting the time contour of the quality of the development of industrial enterprises on the basis of the dynamics of the promotion of new technologies at industrial enterprises.

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Organized crime in the global context: emerging threats and effective responses

Організована злочинність у глобальному контексті: актуальні загрози та ефективні відповіді

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Abstract

The research paper outlines several issues related to the impact that the organized crime nowadays has on global community. Various issues of "group" criminality, its goals and motivations are discussed at length. The difficulty of precisely defining such phenomenon is explored. Two major pieces of international legislation, the United Nations Convention against Organized Crime and the EU Council Framework Decision 2008/841/JHA of 24 October 2008, are discussed in order to reveal some key parameters for introducing national criminal law provisions against organized crime.
By using comparative and other research methods, American, Mexican and Ukrainian approaches to outlining issues of organized crime and responding to them are explained. As a role model, historical roots, structural model and impact of Mafia-type organizations in the United States have been outlined. Also, successful impact of the U.S. Racketeer Influenced and

Анотація

Наукова стаття окреслює кілька питань, пов'язаних із впливом сучасної організованої злочинності на світову спільноту. Детально обговорюються різноманітні питання «групової» злочинності, її цілі та мотивації. Досліджено труднощі точного визначення такого явища. Два основних міжнародних нормативних акта, Конвенція ООН проти організованої злочинності та Рамкове рішення Ради ЄС 2008/841/JHA від 24 жовтня 2008 року, обговорюються з метою виявлення деяких ключових параметрів для запровадження положень національного кримінального права проти організованої злочинності.
За допомогою порівняльних та інших методів дослідження пояснюється американський, мексиканський та український підходи до окреслення проблем організованої злочинності та реагування на них. Як модель для наслідування, окреслено історичне коріння, структурну модель та вплив мафіозних

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Corrupt Organizations Act on such types of criminal activity has been revealed.
Finally, the structure of criminal community in Ukraine as a typical form of organized crime in this country has been described through the legal analyses of its five key elements.

Key words: organized crime, criminal offense, law enforcement agency, terrorism financing.

організацій у Сполучених Штатах. Також виявлено успішний вплив Акту США про корумповані та рекетирські організації на такі види кримінальної діяльності.
Зрештою, структуру кримінального співтовариства в Україні як типової форми організованої злочинності в цій країні було вивчено через правовий аналіз п'яти її ключових елементів.

Ключові слова: організована злочинність, кримінальне правопорушення, правоохоронний орган, фінансування тероризму.

Introduction

The centuries-long fight against crime and particularly against organized crime should be viewed through the lenses of close international cooperation among States to prevent and combat this evil as a whole. This is not a task for a single world jurisdiction but rather for the world community as a collective global entity. Pragmatic "anti-crime" international cooperation has become ever more necessary after the September 11 terrorist attacks on the United States of America.

Modern organized crime has various forms and involves various instruments; it relies on money, reputation and other resources. However, it is important to mention the most prominent forms of organized crime, such as drug trafficking, human trafficking, financial crimes (including money laundering and terrorism financing), arms trafficking. There is no doubt that organized crime makes a huge negative impact on many countries, especially those with transitional economies, and has harmed the development of democratic institutions and democracy in general in these countries (Berisha, 2014). Unfortunately, Ukraine serves as just one of many examples in this respect.

Transnational organized crime is a rapidly escalating issue for the world community. Criminals have demonstrated that they can quickly adjust to new technologies and take advantage of the growing globalization of the world's economies. They know how to exploit borders to their benefit to shield themselves, but do not let issues of national sovereignty, ethnicity, or language stop them when they find an unlawful way to make money (Ohr, 2012).

According to the former American President Barack Obama, technological innovation and globalization have proven themselves as a powerful force for good. However, transnational criminal organizations have exploited our increasingly interconnected world to grow their illegal businesses. Criminal networks are not only expanding their operations, but they are also varying their activities, resulting in a convergence of transnational threats that has become more complicated, unstable, and disruptive (U.S. Department of Justice, 2011).

The primary *goal* of our research is to analyze, within different legal dimensions (international, national, comparative), some pressing issues related to organized crime in the modern globalized world. Based on the provisions of two major international conventions on the issue, as well as national laws of several world jurisdictions, it is expected to reveal both similar and distinct features of organized criminality as perceived by both legislators and societies in different parts of the world.

Methodology

The quality of scientific results obtained in this paper is ensured through the extensive application of long-established research methods.

The *formal legal method* was employed in the course of studying normative legal material, in particular the United Nations Convention against Organized Crime (United Nations Office on Drugs and Crime, 2000) and the U.S. Strategy to Combat Transnational Organized Crime: Addressing Converging Threats to National Security (U.S. Department of Justice, 2011). Using this method allowed to clarify the meaning and significance of the rule of law and other major legal principles when applied to key international legal documents which address various issues of organized crime.

The analytical (doctrinal) research method allowed the authors to use various interpretive techniques in order to examine statutes, practical approaches and other forms of law operation, with the aim of reviewing basic rules and principles of liability for organized crime offenses. Referring to this method allowed to better interpret the fundamental legal category "organized crime" in its broad international context.

The *statistical* methods were employed to analyze online databases and empirical sources, thus allowing for the identification of emerging trends and patterns within the criminal cycle offenses by organized groups. This academic paper primarily relies on non-government research data as the principal source of information, and less so on the court-based or law enforcement data.

Finally, the critical analysis conducted enabled formulation of conclusions and recommendations for improving national and international laws and regulations aimed at combatting organized crime in its various forms.

The combination of such methods of legal research has allowed us to exercise a systematic, comprehensive approach to understanding the illegal nature and crimes committed by organized crime syndicates as well as law enforcement approached to fighting various organized crime groups. In particular, we have studied specific legal provisions (normative-dogmatic method), analyzed law and practice in the given area of criminal law and criminology (analytical method) and used some empirical data (statistical method).

In addition to selecting specific scientific research methods, the methodology of legal research within our work relies heavily on finding the optimal balance between empirical and theoretical approaches to discussing the organized crime phenomenon.

Overall, extensive use of methodological tools of legal research has enabled us to take a closer, in-depth and comparative look at several issues of global security with regard to fighting organized criminality, including various approaches, legal actions and recommendations. It enabled a rigor research and ensured the validity of the results obtained.

The high quality of the research and the academic validity of the results was ensured by the diversified approach to official and academic sources, analytical quality and accuracy of empirical data used.

Literature review

The topic outlined in the title for this research piece is deemed as both relevant and timely.

Various legal issues related to organized crime and transnational organized crime have been researched by Ukrainian (O. Dudorov, Yu. Lutsenko, V. Kovalchuk, D. Kamensky, A. Vozniuk among others) and other foreign (such as F. Cingano, J. Albanese, M. Berisha, K. von Lampe, M. Tonello, K. Gooch, J. Treadwell) scholars at length.

In particular, A. Vozniuk and O. Dudorov collectively observed that legislative changes related to liability for crimes committed by a criminal group, added in 2020, generally had a positive effect, as they provide for elements of influence on the leaders of the criminal world, in particular, they make it possible to bring them to criminal liability for manifestations of socially harmful behavior (Vozniuk & Dudorov, 2021).

D. Kamensky has extensively researched the "white collar" component of international organized crime, by referring, in particular, to RICO Act in the United States and statutes against organized economic criminality in Ukraine. His conclusion: over the three decades of Ukrainian independence the organized crime in this country has evolved from mostly "violent" type to "white collar type" (Kamensky, 2020).

Yu. Lutsenko has researched a nexus between organized crime and illegal immigration, based on which he has formulated the following conclusion: due to its transnational nature, growing dynamics and impact on various aspect of everyday life, migration is increasingly perceived as a serious challenge to the conventional paradigm of certainty and order, i.e. national, public and personal security. The relationship between migration and security has a direct impact on public opinion, political struggle, and governmental decisions (Lutsenko, 2022).

F. Cingano and M. Tonello, in their turn, made a conclusion, based on exhaustive empirical and theoretical data analyses, that policies strengthening law enforcement mainly through perceptions based deterrence or stimulating social control may have non-negligible effects on crime in jurisdictions, which are characterized by the pervasive presence of criminal organizations (Cingano & Tonello, 2020).

And K. von Lampe, in his turn, calls for a comprehensive analytical approach to organized crime, based on the notion that such type of crime is based on a concept driven by three distinct focal concerns regarding: organization of crimes, the organization of criminals, and the organization of social spheres by criminals (Von Lampe, 2019).

Overall, despite a rather extensive body of scholarship related to the outlined research topic, not all aspects of organized crime as a threat to the global community have been covered so far. This paper is written with an analytical goal of addressing such issues, at least partially.

Results and discussion

The United Nations Convention against Organized Crime (also widely known at the Palermo Convention, hereinafter used as such) remains the main international instrument in the fight against transnational organized crime. Being the main international instrument in the ever going fight against transnational organized crime, this document was adopted by the General Assembly resolution 55/25 of 15 November 2000, followed by opening for signature by Member States at a High-level Political Conference convened for that purpose in Palermo, Italy, on December 12-15, 2000 and entered into force on 29 September 2003. It sets up legal standards to assist parties in adopting legislation to establish criminal offenses, and also establishes frameworks for mutual legal assistance and extradition, fosters law enforcement cooperation (United Nations Office on Drugs and Crime, 2000). The convention also has three Protocols that target specific areas and manifestations of organized crime, such as trafficking in persons, smuggling of migrants, and trafficking in firearms. The Convention aims to prevent and address a broad range of criminal activities effectively, and to protect and assist the victims of trafficking in persons with full respect for their human rights. The Palermo Convention remains among the most ratified international legal instruments. Furthermore, it represents a major step forward in the fight against transnational organized crime and the recognition by member states of the seriousness of the issues posed by it, as well as the need to foster and enhance close international cooperation in order to tackle various issues, which are both directly and indirectly related to organized crime.

To this day, the concept of organized crime serves as a focal point in continuing global discussions on criminal policy. For at least two decades, dating back to the formulation of the abovementioned Palermo Convention, there has been widespread acknowledgment, both nationally and internationally, of the gravity of this issue. There is an increasing willingness to collaborate across institutional and jurisdictional boundaries in endeavors to combat organized crime. However, significant uncertainty exists regarding the nature of the threat (Von Lampe, 2019).

Organized crime thrives worldwide, affecting governance and political processes, and at the same time weakening the advancement of the rule of law. Numerous organized crime groups, especially in democratic and industrialized Western nations, primarily engage in international illegal activities. Such activities include drug trafficking, smuggling of illegal immigrants, human trafficking for sexual exploitation, arms trafficking, trafficking in stolen vehicles, and other transnational illegal practices like money laundering and tax evasion (Kleemans & van Koppen, 2020). Common examples also cover cigarette smuggling (Movchan et al., 2021) and customs fraud (Pidgorodynskyi et al., 2021), various environmental crimes and soil pollution in particular (Movchan et al., 2022). The so-called transit crime as an emerging form of organized crime focuses on generating profits through international illegal trade rather than through traditional methods such as protection, extortion, or the exploitation of monopoly power, commonly known as “racketeering” (more about the meaning of this term later).

Organized criminal groups are flexible in changing or expanding their illicit businesses for profit. They traditionally misuse vulnerabilities and crisis situations such as the COVID-19 pandemic, economic downturns, natural disasters, and armed conflicts exploiting them for their own purposes. Thus, there are a number of similar features between, for example, organized crime and white-collar crime (Lutsenko et al., 2023).

As K. Gooch and J. Treadwell argue, the ‘era of hard drugs’ has been superseded by an ‘era of new psychoactive drugs’, redefining social relations, transforming the prison illicit economy, producing new forms of prison victimization and generating far greater economic power and status for suppliers. These changes represent the complex interplay and compounding effects of broader shifts in organized crime, among various other factors (Gooch & Treadwell, 2020). Historically, all major shifts in drug trafficking have been related to organized crime. Mexican drug cartels are just the latest example.

On July 25, 2011, the U.S. National Security Staff released a fundamental document – the Strategy to Combat Transnational Organized Crime: Addressing Converging Threats to National Security. According to this strategic document, transnational organized crime denotes persistent groups of individuals who operate internationally with the aim of acquiring power, influence, financial gains, and/or commercial benefits, either entirely or partially through unlawful methods. They safeguard their pursuits through a combination of corruption and/or violence, or by employing a transnational organizational framework and exploiting international commerce or communication channels. The structure of transnational organized crime lacks uniformity, ranging from hierarchical setups to clans, networks, and cells, with the potential to adopt other configurations over time. The nature of their criminal activities varies, and these criminals exhibit certain characteristics, in particular they:

1) engage, at least in some of their activities, in violence or other acts intended to intimidate or make explicit or implicit threats;
2) exploit disparities between countries to advance their objectives, enhancing their organization, increasing its influence, and/or avoiding detection or apprehension;
3) endeavor to wield influence in government, politics, and commerce through both corrupt and legitimate means;
4) strive to shield both their leadership and members from detection, sanctions, and/or legal prosecution through their organizational structure.
5) also, their primary objective is economic gain, not only through overtly illegal activities but also through investments in lawful enterprises (U.S. Department of Justice, 2011).

The following diagram (Fig. 1), elaborated by the Global Initiative Against Transnational Organized Crime, demonstrates the 2023 global averages for various criminal markets.

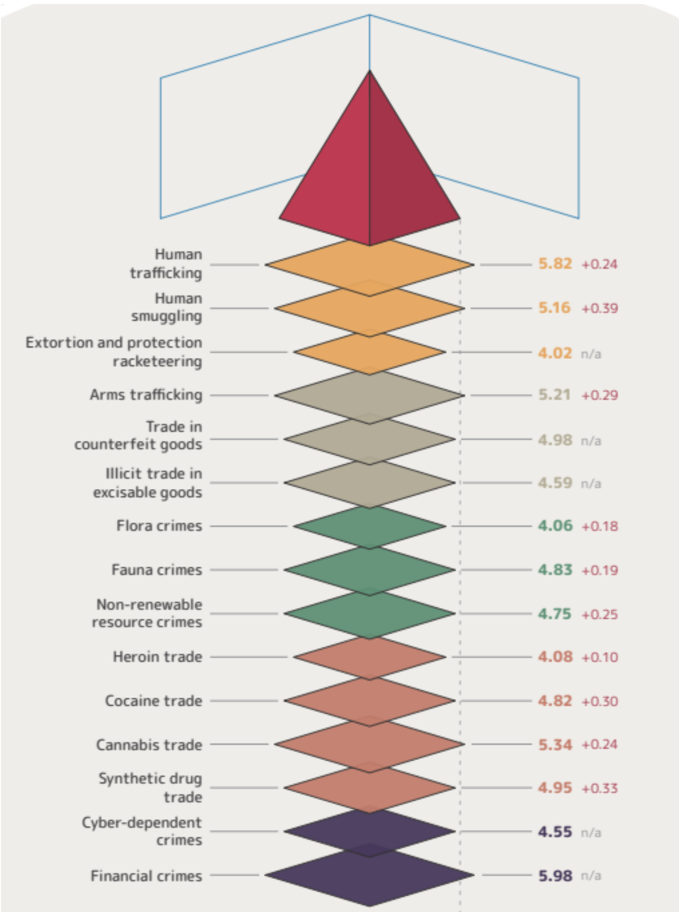

Figure 1. Criminal markets, global averages, 2023.
Source: Mexico Profile (2023).

As put by American commentator Jay S. Albanese, organized crime is a term with a vague and unclear definition in law – thus, the lack of precise definitions results in imprecision. A consensus of some degree over the definition has been established over the years, thus characterizing organized crime as an ongoing criminal enterprise with several key elements:

a) planned and rational acts carried out by groups of individuals;
b) crimes that often cater to public demand for illicit goods and services;
c) the primary objective being financial or material gain;
d) the use of corruption and intimidation to safeguard ongoing criminal operations.

It is important to note that organized crime pursues financial gain, setting it apart from terrorism, certain hate crimes, or other forms of organized criminal behavior centered on ideology or political objectives (Albanese, 2021).

A quite successful, in our opinion, conceptual attempt of coining the term “organized crime” was made in the EU Council Framework Decision 2008/841/JHA of 24 October 2008 on the fight against organised crime adopted by the Council of the European Union. According to this document, ‘criminal organisation’ means a structured association, established over a period of time, of more than two persons acting in concert with a goal of committing offences which are punishable by deprivation of liberty or a detention order of a maximum of at least four years or a more serious penalty, to obtain, directly or indirectly, a financial or other material benefit (European Union, 2008). Thus, the European legislator has chosen the formal parameters as background for the definition – the minimum number of members, existence over a period of time, severity of penalty.

Based on the results of their own comparative analyses, some Ukrainian researchers argue that similar criminal associations in the criminal legislation of different states can exhibit both similarities and differences. In specific instances, certain states’ criminal codes encompass diverse criminal associations, utilizing both distinct and overlapping terms (e.g., “criminal association”) within their respective jurisdictions. When examining the criminal law characteristics of organized groups as outlined in the Palermo Convention and criminal organizations defined by Framework Decision 2008/841/JHA, a clear observation emerges: these entities represent criminal associations of identical nature. The international community recommends criminalization of membership in criminal associations with uniform parameters, even though individual states may employ different terminology. The partial justification for separately criminalizing actions performed by members of organized groups and criminal organizations across different states lies in the consideration of distinct international legal acts, primarily the Palermo Convention and the Framework Decision 2008/841/JHA, by national legislators (Vozniuk et al., 2020).

In the ever-shifting landscape of public life and global environment in general, organized criminal activity is also a constantly evolving phenomenon. Take American Mafia for example. As is the common knowledge, Mafia is a network of Italian-American organized crime groups, which emerged in the late 19th and early 20th century, especially in New York and Chicago, as a result of immigration from Sicily and other regions of Southern Italy. The Mafia initially engaged in bootlegging during the Prohibition era, and later expanded into other illegal activities such as drug trafficking, gambling, prostitution, racketeering, extortion, money laundering, and murder. The Mafia also has been infiltrating various legitimate businesses and labor unions, and also influenced politics and law enforcement.

The Mafia as a generic organized crime concept reached its peak of power and influence in the mid-20th century, under the leadership of notorious figures such as Al Capone, Lucky Luciano, Meyer Lansky, Frank Costello, Carlo Gambino, and John Gotti. However, the Mafia also faced increasing challenges from law enforcement and government, which used anti-racketeering laws, such as the Racketeer Influenced and Corrupt Organizations (RICO) Act, to prosecute and convict high-ranking mobsters and weaken the Mafia. The Mafia also suffered from internal conflicts, defections, and competition from other criminal organizations. Although it still operates today, it is a much less powerful and influential organization than it used to be in the past (McIntosh, 2023).

The organizational structure of an American Mafia family (based on the typical structure of five New York crime syndicates), which bears more or less resemblance to organized criminal structures in other countries, is best explained in Figure 2.

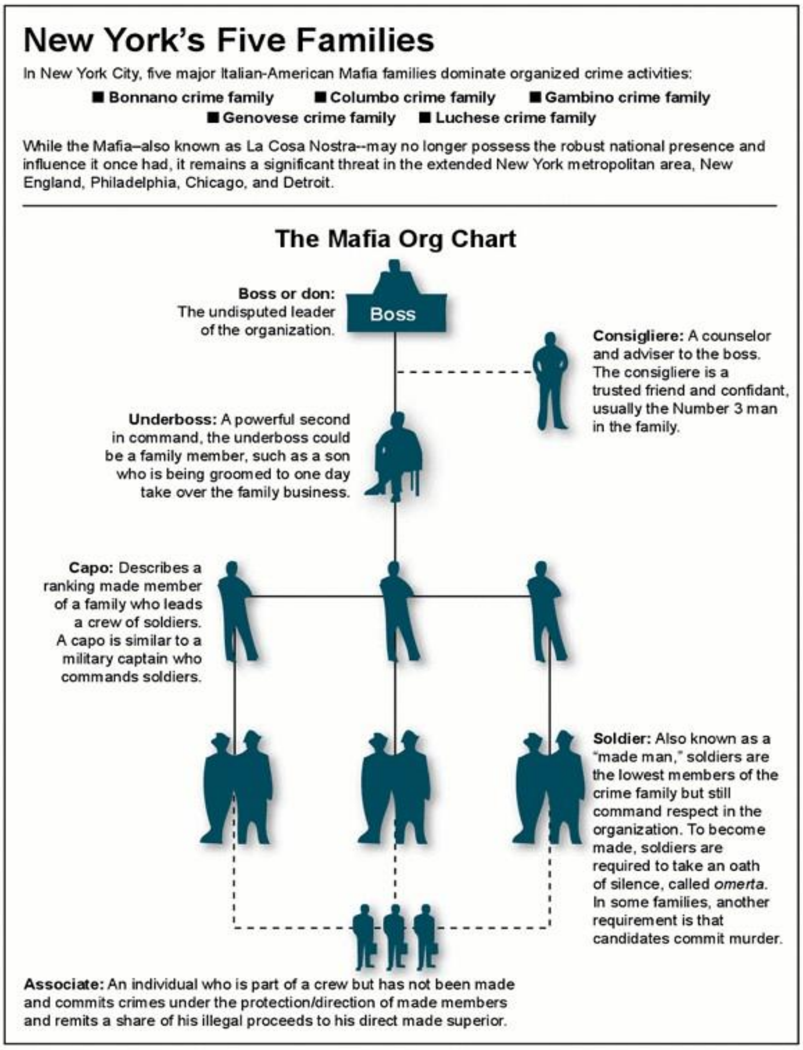

Figure 2. The Mafia Org Chart
Source: FBI. (2023).

Here is just one (of many) illustrative example of organized crime in the United States operating and then brought to justice, which refers to the above-mentioned Mafia Org Chart. On September 14, 2021, in federal court in Brooklyn, a 19-count indictment was unsealed charging 14 defendants, including 10 members and associates of the Colombo crime family of La Cosa Nostra and a member of the Bonanno organized crime family, with various offenses including labor racketeering involving multiple predicate acts of extortion conspiracy, attempted extortion and extortion, extortionate collection of credit conspiracy, extortionate collection of credit and money laundering conspiracy. The charges in the indictment against the Colombo crime family members related to multiple charged schemes in a long-running effort by the crime family to infiltrate and take control of a Queens-based labor union (the "Labor Union") and its affiliated health care benefit program (the "Health Fund") that provides medical benefits, including dental, optical and pharmacy benefits, to the members of the Labor Union, and to a conspiracy to commit fraud in connection with workplace safety certifications (United States Attorney's Office, 2021).

Also, a brief overview the above-mentioned RICO Act and its impact on putting organized crime in America down will be of relevance here. The history of the Act, which at the highest legislative level embodies American counteraction to organized crime, including economic crime, dates back to 1970. According to its legislative design, RICO was supposed to introduce a new "game plan" in the form of an autonomous set of legal grounds for applying criminal sanctions for various crimes committed by persistent criminal associations (criminal organizations). By targeting specific criminal organizations, Congress sought to overcome the significant negative impact that organized crime has on American society. The legislative history of RICO has not only repeatedly demonstrated the need to reduce the impact of organized crime on legitimate business, but also actualized the need to protect general public from those who run such organizations to the detriment of public interest.

According to the Black's Law Dictionary, a widely recognized legal reference authority, RICO is a federal statute which has been designed to combat organized criminal activity and preserve the integrity of the marketplace by providing for the control and prosecution of persons who engage in or conspire to engage in racketeering activity. Accordingly, racketeering is explained in this Dictionary as: 1) a system of organized crime that traditionally involves extortion of money from businesses through threats, violence or other illegal means and 2) manifestation of illegal activities (e.g., bribery, extortion, fraud or murder) which are carried out within a criminal enterprise (including any criminal syndicate), which, in turn, is controlled or owned by persons directly involved in criminal activities (Garner, 2014).

Among various academic studies devoted to clarifying the legal content and law enforcement potential of the RICO Act, the study by A. Vozniuk is noteworthy. In his monograph "Criminal Liability for the Establishment of and Participation in Criminal Associations", this author comprehensively analyzes the block of criminal law provisions of RICO, calling this Act a modern example of a conditional model of entrepreneurship in the context of combating organized crime. He identifies the following features (characteristics) inherent in a "criminal enterprise" as a basis for criminal liability for organized criminal activity: 1) the enterprise model does not require proof of an agreement between a group of accomplices – in a simplified form, the RICO model is focused on the actual criminal activity of the "enterprise"; 2) in the RICO model, the concept of "enterprise" is not used in the standard sense – based on part. 4 of § 1961 of the US Criminal Code, it includes any individual, partnership, corporation, association or other legal entity, as well as any union or group of related persons not being legal entities; 3) the purpose of RICO is to punish persons involved in a "racketeering activity" scheme; 4) the key role in the issue of criminal prosecution under RICO is played by the proof of specific predicate offenses defined in the law that embody racketeering activity; 5) one of the main advantages of the RICO model compared to other models is its ability to combine several predicate offenses into a separate RICO offense that reflects the organized nature of criminal activity (Vozniuk, 2018).

It is worth adding that while in 1970, when RICO was enacted, this Act had embodied thirty predicate offenses, today there are over a hundred such crimes. Such significant quantitative growth is generally in line with the trend in American criminal law over the past fifty years of increasing (not always properly justified) the number of federal crimes. We are talking about the intensively debated (and also controversial) phenomenon of excessive criminalization of acts in American society.

As an interim observation, criminal legislation of most world jurisdictions does not offer analogues to the comprehensive legislative mechanism for combating organized crime embodied in the US within the extensive and quite effective RICO provisions. At the same time, American law and practice in this area can and should be compared to available domestic provisions, regulatory and law enforcement developments. A priori, the possibility of such useful (not only in the theoretical context) comparison will allow various national legislators, law enforcement agencies and courts to advocate for a much more active approach to fight organized crime.

Overall, the ongoing serious battle against organized crime, as American experience illustrates, can be effective if there are such factors in place: public demand, political will, both flexible and "tough on crime" legislation and also motivated and uncorrupt law enforcement.

Nowadays any unbiased observer can see a drastic contrast between effective cracking on organized crime in the U.S. and almost zero progress on the same law enforcement front, let us say, in Mexico. Indeed, organized crime syndicates in this country, namely notorious drug cartels, are prospering in both money-making and violence and at the same time even the national military cannot deal with them. Among the major reasons for such negative situation is the prevailing corruption in Mexican government and the society at large.

Mexican drug trafficking organizations exercise control over the US's heroin market, with almost all heroin confiscated and tested in the US coming from this South American country. Mexican drug trafficking organizations are major actors in the global cocaine trade, acting as intermediaries and transporters of the drug worldwide. Mexico is an important transit country for cocaine from South America to the US and increasingly to the EU. Criminal groups have become more involved in Central American and Colombian cocaine trafficking markets, and territorial conflicts between them over control of north-bound cocaine shipment routes to the US have caused extremely high levels of violence across Mexico. At the same time, Mexican cartels are involved in methamphetamine trafficking to EU ports for further distribution inside and outside the EU (Europol, 2022).

Mexico's drug trafficking organizations are some of the most advanced mafia-style groups in the world. They have considerable territorial control throughout the country and co-opt state institutions through corruption and coercion. Besides drug trafficking, these organizations engage in other criminal activities such as oil theft, human trafficking, kidnapping, and extortion, thus making billions of dollars every year. Mexican drug trafficking organizations fuel violence across the country using various firearms, including military-grade weapons, resulting in fierce territorial conflicts with rival drug trafficking organizations and state security entities. The state's no-confrontation policy and perceived impunity worsen retaliatory attacks against law enforcement initiatives (Mexico Profile, 2023).

Thus, Mexican organized crime might serve as a case study for the wide scale and systematic impact on the society in any given nation when there is no law enforcement pushback but at the same time the country is plagued by the endemic corruption.

There is a variety of law enforcement tools available to the international community in its war against organized crime in various parts of the world. For example, as the leading global police organization, Interpol has created the Organized and Emerging Crime Strategy to help its 190-member countries effectively deal with the changing nature of organized and emerging crime in the modern era. The main objectives of the five-year (2016-2020) strategy have been to: enable member countries to target and disrupt cross-border criminal networks; and to identify, analyze and respond to emerging criminal threats. In order to tackle the dual challenge, the Interpol strategy outlines four interrelated action tools:

1) *identification of criminal networks* – identifying key players involved in serious transnational crime, related criminal networks and their main activities;
2) *illegal trafficking and illicit markets* – fighting criminal networks involved in all kinds of illegal trafficking and identify and address new trends and illicit markets;
3) *enabling crimes and criminal convergence* – elaborating on connections between different types of crimes and how one crime can facilitate another, and help police in stopping such enabling crimes from leading to more criminal activity;
4) *illicit flows of money and assets* – disrupting profits of organized criminal networks by tracing and preventing the movement of criminal assets, as well as freezing and confiscating them (Interpol, 2021).

Obviously, helping all member countries to combat various forms of organized transnational crime is vast and complex. The Interpol strategy focuses on the most serious criminal threats as well as various emerging forms of crime. It builds on the law enforcement agency's experience in leading and coordinating major cross-border operations against multiple types of crimes and achieving significant results in terms of arrests and seizures of illicit commodities.

One of the major online instruments for monitoring the status of organized crime parameters is the Global Organized Crime Index (hereinafter – the Global Index). It is a multi-dimensional tool that measures the level of criminality and resilience to organized crime for 193 countries along the three key pillars – criminal markets, criminal actors and resilience. The tool is supported by over 400 expert assessments and evaluations by the regional observatories. The aim of the Index is to provide metrics-based information that would help policymakers, continental and regional bodies to prioritize their actions based on a comprehensive assessment of where vulnerabilities lie, and provide them with the means to evaluate the effectiveness of their responses to reduce the impact of the organized crime globally.

Analytical tools like this one help in comprehending some key issues surrounding the fundamental of organized crime and its core principles of operation, largely driven by income-earning motivation.

Mexican organized crime and its negative impact both domestically and on its neighbor – the U.S., current Interpol initiatives, as well as analytical data on the current status of organized crime in various jurisdictions – all this can be labeled collectively as transnational organized threat.

Structurally solid and long-lasting criminal entities like Sicilian mafia groups, Japanese Yakuza groups, Hong Kong Triads, and Russian mafia groups have either existed or still exist in recent history. However, in numerous democratic and industrialized Western nations such organizations are either no longer present or represent exceptions rather than the norm. The primary factor contributing to this is that illicit markets, frequently international in scope, often coupled with robust government institutions and effective law enforcement, impede the development of extensive and enduring criminal organizations (Kleemans & van Koppen, 2020).

Finally, and within the scope of our comparative analyses, we will turn to organized crime in Ukraine. There organized crime takes on various forms, with a notable emphasis on criminal communities exhibiting characteristics of organized, recidivist, and professional criminal activities. Participants in these communities adhere to specific rules, follow established traditions, have developed an extensive infrastructure, and engage in effective collaboration with organized criminals in other countries. A particular concern with such communities is that prosecuting individual members and their associations does not necessarily lead to their dissolution. Instead, one criminal figure is often replaced by another, thus allowing the continuation of organizing, coordinating, or facilitating criminal activities within a specific territory. This, in part, explains why, despite authorities' efforts to eradicate this form of organized crime, it persists successfully beyond the post-Soviet states.

Ukrainian scholars understand the process of forming a criminal organization as the one consisting of two independent stages: 1) *preparatory* (that is, support for the creation of a criminal organization: a thorough, detailed assessment of the favorable situation and the possibilities of its use for the creation of a criminal organization of a specific focus; selection based on objective calculation of the optimal option/way of its formation; determination of the structure of the criminal organization, its needs in human and other resources, the general and components of the target and functional orientation criminal activity, subordination scheme of structural parts and individual participants, quantitative and qualitative characteristics of the organization and its structural parts; development of the conspiracy system and rules of internal security, etc.) and 2) *actual creation* of a criminal organization (search, study and selection candidates, attracting them/achieving an agreement/obtaining their consent to join a criminal organization to commit joint purposeful criminal activity; distribution/consolidation of roles between persons who have entered/accepted into the community; determination of their personal position and duties in the organization/structural part, line of conduct, etc.) (Kovalchuk, 2013).

Just as in other national (or ethnic) criminal organizations, the structure of the criminal community in Ukraine can be described by several key elements. Ukrainian commentators name five such elements.

Firstly, at the apex of its hierarchy are "code-bound thieves", commonly referred to as "thieves in law" or simply "thieves", thus signifying individuals bound by a criminal code.

Secondly, the primary function of the criminal community is to organize, control, and coordinate criminal and illegal activities within specific territories or areas. Notably, exercising control over an ordinary crime is a distinctive feature of a mafia-type organization, setting it apart from other forms of organized crime.

Thirdly, the economic foundation of this organized crime variant lies in a so-called "common fund", financed by contributions from both legal and illegal activities. This fund serves collective needs of the criminal world, including support for individuals incarcerated in detention centers.

Fourthly, the criminal world adheres to specific customs and traditions that have significantly evolved over time. While subject to transformation, these customs are predominantly observed among community members and other criminal offenders.

Lastly, criminal community features a collegial management body known as the meeting. This body addresses the most critical issues related to criminal and illegal activities, contributing to the organized and structured nature of the criminal network.

Moving toward the end of our scholarly discussion, it should be noted that the impact of Russia's invasion on the criminal underworld is seismic, akin to an earthquake. The resilient Ukrainian mobsters, traditionally closely aligned with their Russian counterparts, have overwhelmingly ceased criminal collaboration. This significant shift is not limited to ideological changes; it has tangible effects on illicit activities such as heroin smuggling. The rerouting of lucrative smuggling routes has widespread repercussions, while influencing prices and profits for criminal syndicates operating thousands of miles away. If such disruption endures, it has the potential to reshape the whole landscape of global crime. Indeed, such changes are already underway, both in Ukraine and in other countries (The Economist, 2023).

As yet another organized crime phenomenon, which is emerging at the background of current war in Ukraine, is humanitarian aid embezzlement – immoral and now illegal behavior on a large scale, which we have previously researched at length (Kamensky et al., 2023).

We also agree with the scholars, who write that the strategy of combating organized crime in Ukraine should primarily include combating corruption, because even in the presence of ideal laws on criminal liability, representatives of organized criminal activity will avoid criminal sanctions, if not completely, then at least to a fair degree. Indeed, in the recent years Ukrainian commentators observe a surge of corruption-related offenses among various organized criminal groups (Vozniuk et al., 2021). This emerging issue needs to be addressed in a fast and decisive manner.

Also, due to the unprovoked Russian aggression against Ukraine, the migration-related organized crime also causes big concerns for both law enforcement and the government of Ukraine in general (Lutsenko, 2022).

Nowadays organized crime is also connected to terrorism financing. In the past, money.

Thus, we can make a conclusion that nowadays almost any world jurisdiction has some form of organized crime – such illegal "societies" have their distinct features; however, their common element is organized (often hierarchical) and well-preserved structure.

Conclusions

In the course of our research we were able to formulate the following conclusions.

In foreign criminal legislation, distinct terms are employed to characterize criminal groups (criminal organizations), and diverse approaches are adopted for the criminalization of their activities. National legislation of different states outlines varying legal strategies for combating organized crime. Specifications for the criminalization of the activities of organized criminal groups and members of such organizations are encapsulated in various international legal instruments.

Nowadays, transnational organized crime presents a direct and further escalating menace to such vital areas as public health, safety, and national security. Criminal organizations operating across borders are involved in a wide spectrum of unlawful activities, including drug and weapons trafficking, migrant smuggling, human trafficking, cybercrime, intellectual property theft, money laundering, wildlife and timber trafficking, illegal fishing, and illegal mining.

Such networks are continuously growing in size and influence, both, as we have shown, within the United States, Ukraine, Mexico and elsewhere. Furthermore, transnational criminal organizations jeopardize national security by undermining security and stability of allied and partner nations, eroding the rule of law, fostering corruption, serving as proxies for hostile state activities, directly or indirectly funding insurgent and terrorist groups, depleting natural resources, posing risks to human health and the environment, contributing to climate change through illegal deforestation and logging, and exploiting and endangering vulnerable populations.

In certain regions criminal organizations possess capabilities akin to states, disregarding sovereign borders, compromising the integrity of democratic institutions, threatening the legitimacy of fragile governments, and consolidating their power through intimidation, corruption, and violence. Effectively addressing the threat posed by organized criminality necessitates a unified federal framework, supported by a comprehensive whole-of-government initiative executed in cooperation with local, national and international partners, also while collaborating with mass media and civil society activists.

The bottom line argument is as follows: organized crime in the XXI century evolves further and thus strong legislative and law enforcement responses to this dangerous phenomenon should evolve even faster.

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Alternative forms of resolution of labor disputes

АЛЬТЕРНАТИВНІ ФОРМИ ВИРІШЕННЯ ТРУДОВИХ СПОРІВ

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Abstract

The purpose of the article is to identify effective alternative forms of labour dispute resolution based on the analysis of theoretical information and practical experience of their application in the modern world and the possibility of their use in Ukraine. The methodological basis of the work is the methods of analysis and synthesis, comparative law, logical and legal, abstract and logical methods, and the method of generalisation. The author identifies the features and advantages of using the main alternative forms of labour dispute resolution: conciliation, direct negotiations, mediation, arbitration, and mediation. The author examines the international experience of using alternative forms of labour dispute resolution (France, Bulgaria, Poland, and the United Kingdom). The reasons for the low prevalence of the use of alternative forms of labour dispute resolution in Ukraine are: lack of legislative regulation or gaps in it; low level of public awareness; lack of qualified specialists (arbitrators, mediators). The author identifies the appropriate measures for the effective implementation of alternative forms of labour

Анотація

Метою статті є визначення ефективних альтернативних форм регулювання трудових спорів на основі аналізу теоретичних відомостей та практичного досвіду їх застосування в сучасному світі та можливість їх використання в Україні. Методологічно основою роботи є методи аналізу і синтезу, порівняльного права, логіко-правовий, абстрактно-логічний метод та метод узагальнення. Визначені особливості та переваги застосування основних альтернативних форм вирішення трудових спорів: примирення, безпосередні переговори, медіація, арбітраж та мед-арб. Розглянутий міжнародний досвід застосування альтернативних форм вирішення конфліктів в сфері праці (Франція, Болгарія, Польща та Велика Британія). Причинами низької поширеності використання альтернативних форм вирішення трудових спорів в Україні виступають: відсутність законодавчого регулювання або наявність прогалин в ньому; низький рівень поінформованості населення; нестача кваліфікованих спеціалістів (арбітрів, медіаторів). Визначені доцільні заходи для

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dispute resolution in Ukraine, which will reduce the burden on the judicial system, and resolve labour conflicts more quickly, efficiently, and with lower material costs.

Key words: regulation, legislation, labour disputes, mediation, arbitration, conciliation, alternative dispute resolution, forms of labour rights protection, non-jurisdictional forms of labour rights protection.

ефективного впровадження застосування альтернативних форм регулювання трудових спорів в Україні, які дозволять знизити рівень навантаження на судову систему, вирішувати трудові конфлікти більш оперативно, результативно та з меншими матеріальними витратами.

Ключові слова: регулювання, законодавство, трудові спори, медіація, арбітраж, примирення, альтернативні способи вирішення спорів, форми захисту трудових прав, неюрисдикційні форми захисту трудових прав.

Introduction

In today's world, the issue of labour dispute resolution is of particular importance. The international community pays special attention to the protection of the human right to work, as labour is the main source of well-being for citizens and the state as a whole.

The dynamism of change, economic crises, changes in labour organisation at the international level related to the COVID-19 pandemic, the impact of sociocultural changes on labour relations - all of this contributes to an increase in the level of pressure employers exert on employees. In addition, there is instability in the labour market, which can also have a negative impact on the exercise of employees' rights.

The protection of labour rights is more often considered in the context of court proceedings, but alternative forms of labour dispute resolution are becoming increasingly important. Scholars study various ways of regulating and resolving labour disputes outside of court, but there is no unified approach in the scientific community on this issue.

Alternative forms of resolving labour disputes allow for a settlement of the situation, thus relieving the country's judicial system. In addition to alternative labour dispute resolution, online labour dispute resolution is gaining popularity. Alternative methods and online labour dispute resolution are characterised by greater flexibility, efficiency, and convenience compared to the court procedure.

The current legislation of European countries emphasises the importance of the human right to work. For example, the European Social Charter states that achieving and maintaining stability and high levels of employment is one of the leading objectives of public policy (Council of Europe, 1996). The Charter also establishes the task of the state to protect the right of every worker to earn a living through his or her chosen profession. However, despite the tasks set out in the Charter, the number of labour disputes is not decreasing, so it is important to implement and develop effective ways to resolve labour disputes, taking into account the current dynamic realities.

This is especially true in Ukraine, as the development of labour relations is currently in its infancy. The settlement of labour disputes is the most vulnerable area due to outdated and inefficient labour legislation. It should be noted that Ukrainian legislation is gradually being improved and changes are being implemented, but it is necessary and important to introduce a legislative mechanism for regulating labour disputes through alternative forms.

Therefore, it is advisable to analyse and study the specifics and experience of using alternative forms of labour dispute resolution, which will reduce the burden on the judicial system, speed up the labour dispute resolution process and peacefully resolve conflicts in the field of labour relations.

The paper aims to identify effective alternative forms of labour dispute resolution based on the analysis of theoretical information and practical experience of their application in the modern world and the possibility of their use in Ukraine.

Methodology

The researchers carried out a comprehensive and systematic analysis of alternative forms of labour dispute resolution, which involves the application of general theoretical and special scientific methods and approaches.

Using the method of comparative analysis, the author identifies the advantages and disadvantages of judicial and extrajudicial forms of labor dispute resolution.The dialectical method is used for the general characterization of alternative forms of labor dispute resolution. It is established that alternative forms of labor dispute resolution are more efficient, cost-effective and effective.

A systematic analysis of the theoretical contributions of modern Ukrainian and foreign authors has made it possible to identify the most common alternative forms of conflict resolution in the labor sphere: mediation, conciliation, direct negotiations, arbitration and med-arb. The author highlights the features and specifics of each type of out-of-court forms of labor dispute resolution.

The methods of analysis and synthesis made it possible to identify the specific features and distinctive characteristics of mediation, arbitration, direct negotiations, and conciliation as the main alternative forms of labour dispute resolution.

To achieve this goal, the author uses the following research methods: analysis of legal, scientific, and methodological literature by foreign scholars and Ukrainian authors to define the categorical and conceptual apparatus of the study; analysis of legislation to determine the features, specifics, and advantages of alternative forms of labor dispute resolution in different countries.

The information and analytical basis of the article is made up of international legal and regulatory documents governing the use of alternative forms of labor dispute resolution in different countries of the world:

1) International

1. Committee of Ministers of the Council of Europe. (1981).
2. Committee of Ministers of the Council of Europe. (1986).
3. Committee of Ministers of the Council of Europe. (2002).
4. Directive on certain aspects of mediation in civil cases and commercial affairs (2008).
5. Committee of Ministers of the Council of Europe. (1998).
6. Convention on International Settlement Agreements Resulting from Mediation (United Nations, 2019).
7. European Social Charter. Council of Europe (1996).

2) Ukrainian:

1. Law on Mediation No. 1875-IX. (2021). Law of Ukraine dated November 16, 2021.
2. Law of Ukraine No. 1618-IV. Civil Procedure Code of Ukraine: of March 18, 2004.
3. Labour Code of Ukraine (2019). Consolidated version as of June 1, 2019.

3) Other states:

1. Labor Code of the Republic of Poland (1974).
2. French Labour Code (2019).
3. Bulgarian Law on Mediation (2004).
4. Labour Code of the Republic of Bulgaria (1987).

The method of comparative law helped to determine the specifics of the use of alternative forms of labour dispute resolution in different countries in order to identify the possibilities of implementing such forms of labour dispute resolution in Ukraine. The comparative legal method also helped to formulate general recommendations for the effective use of alternative forms of labour dispute resolution in Ukraine to protect the rights of employees.

The author examines the practice of applying alternative forms of labor dispute resolution in different countries of the world on the example of Poland, Bulgaria, Great Britain and France.

A systematic approach is used to study each element of the system of alternative forms of labor dispute resolution, their interconnection, and differences, with a view to determining the advantages and limitations of each type of issue under study.

Based on a systematic analysis of international experience in the use of alternative forms of labor dispute resolution, the author identifies the specific features of each type of out-of-court labor dispute resolution. The following characteristics are highlighted: participants to the labor dispute resolution procedure; final result; features; advantages and disadvantages. A comparative analysis of alternative forms of labor dispute resolution is carried out based on the following features: duration of the procedure; the need for participation of experts/specialists; and cost of the procedure.

The comparative legal method also helped to formulate general recommendations for the effective use of alternative forms of labour dispute resolution in Ukraine to protect the rights of employees.

The logical and legal method was used to analyse the specifics of labour dispute resolution in Ukraine. Generalisation of theoretical provisions, the establishment of cause and effect relationships, and the formulation of conclusions were carried out using the abstract logical method and the method of generalisation.

The analysis of the specifics of alternative forms of labor dispute resolution made it possible to determine the possibilities of implementing international experience into Ukrainian practice.

The authors conclude that it is advisable to introduce the use of alternative forms of labor dispute resolution in Ukraine at the legislative level. Based on the results of the study, the authors conclude that the most relevant and effective forms of labor dispute resolution in Ukraine will be such alternative forms of labor dispute resolution as conciliation, direct negotiations and mediation. This is due to the advantages of these forms of labor dispute resolution, such as the effectiveness of the final result and lower material costs for the procedure.

The author uses the methods of abstraction and generalization to identify the peculiarities of the implementation of alternative forms of conflict resolution in the labor sphere in Ukraine in modern conditions. The modeling and forecasting methods allowed the author to identify ways to improve the use of alternative forms of labor dispute resolution in Ukraine. By using the method of analysis and generalization, the author draws conclusions based on the study.

Literature review

Consideration of the issue of alternative forms of labour disputes regulation should begin with the definition of the essence of the concept of “labour disputes”. Thus, V. Burak understands the concept of labour disputes as “disagreements between the subjects of labour relations that are not settled as a result of mutual negotiations and arise from the application of labour legislation or the establishment or change of working conditions” (Burak, 2003; p. 12).

Yu. Shemchushenko et al., (2004) gives a deeper definition of the term labour relations:

these are unresolved disagreements that arise between an employee and an employer or between employees and employers on the application of laws, other labour regulations and the terms of an employment contract or the establishment or change of working conditions, conclusion of an agreement. (p. 576).

The peculiarity of this definition is the allocation of types of labour disputes, depending on the subject - individual and collective labour disputes.

It is advisable to identify the limitations and inaccuracies of the above definitions with regard to such a characteristic as “unsettledness”. At present, labour relations are sufficiently regulated by both regulations and provisions of employment contracts. Therefore, it is necessary to provide a more precise definition of the concept under study. Ukrainian scholars define labour disputes as “disagreements between labour law subjects on the application of labour law or the establishment of new working conditions submitted to a jurisdictional body for consideration” (Yaroshenko, 2022).

Labour disputes can be resolved in court or out of court (Mishchuk, & Pasichnyk; 2014). Previously, labour rights protection usually took place in court, so labour disputes took a long time to resolve.

(Vavzhenchuk, 2013) notes that

in practice, the protection of labour rights is usually limited to judicial protection, which is far from perfect and does not always provide timely and prompt protection of violated labour rights, as the courts are, firstly, overloaded, and secondly, the current system of consideration and resolution of labour disputes needs to be improved (p. 444).

Therefore, the out-of-court procedure, which involves the use of conciliation procedures - alternative forms of labour dispute resolution - is becoming increasingly common. Scholars define alternative ways of resolving labour disputes as “a set of procedures not prohibited by law aimed at peaceful settlement of disputes between the parties on the basis of coordination of their positions and interests, carried out by the parties to the conflict themselves or with the involvement of other persons, to develop a mutually acceptable solution that satisfies the interests of each of them and aims to resolve the conflict” (Burak, 2015).

Considering the practice of labour dispute resolution in Ukraine, it is worth noting a significant event - the signing of the Association Agreement with the European Union. As a result, “Ukraine has undertaken to carry out certain reform actions aimed at transforming legal regulation, in particular the labour sphere and the sphere of labour dispute resolution, to European standards" (Terekh, 2020). Accordingly, the practice of resolving labour disputes in Europe is dominated by out-of-court mechanisms, which are characterised by higher efficiency and promptness.

(Rieznikova, 2012; p. 10) notes that "alternative dispute resolution is defined as a group of processes by which disputes, conflicts and cases are resolved without resorting to court proceedings". In turn, (Izarova, 2015) specifies that "alternative dispute resolution methods provide a real opportunity to resolve a dispute without a trial and overcome the related problems of high cost, excessive duration, complexity, and the need to represent interests in court" (p. 255). In other words, alternative forms of labour dispute resolution provide easy access, efficient dispute resolution, and proportionate costs.

Any mechanism for resolving labour disputes that takes place outside of court proceedings is considered to be an alternative. Typically, alternative forms of labour dispute resolution include neutral assessment, conciliation, mediation, negotiation, and arbitration. An increasing number of countries are adopting alternative forms of labour dispute resolution due to the increased workload of the judicial system, the rising costs of litigation, and time delays. Some such programmes are mandatory, while others are voluntary. The most common "forms of alternative dispute resolution are arbitration and mediation, the parties to the relevant relations almost always try to resolve disputes through negotiations, and the main advantage of this form is that it allows the parties themselves to control the process and resolution" (Legal Information Institute, 2021).

(Barona, 2014) notes that "alternative dispute resolution was initially perceived as an alternative to state courts, but today it is clear that alternative dispute resolution is a complement to the judicial system".

V. Burak (2017), clarifying the definition of the concept of alternative forms of labour dispute resolution, notes: "only such methods that are consensual in nature and necessarily involve the participation of neutral, independent persons in the dispute resolution are recognised as an alternative". The advantage and specificity of such methods is that the parties can make their own decisions and settle the dispute or resolve the conflict by engaging an intermediary.

Analysing the world experience of applying alternative mechanisms of labour dispute resolution confirms the feasibility and effectiveness of this form of conflict resolution (Paladii, & Sheveleva, 2007 p. 4-7). This is a very real and viable mechanism of conflict resolution (Hoiko, 2011). Therefore, in European countries, 80 % of labour disputes pending before the courts are referred to mediation and eventually resolved out of court (Volkovytska, 2018).

Most European civil procedure codes provide for the mandatory use of alternative dispute resolution methods. Thus, in Belgium and France, the court must offer the parties to resolve the conflict through ADR mechanisms, and in England, the court has the right to impose financial sanctions on the parties to the dispute if they refuse, for example, mediation (Kossak, 2009).

(Hryn, 2022) notes the important role of the Committee of Ministers of the Council of Europe, which has adopted a number of acts aimed at simplifying access to justice:

1. Committee of Ministers of the Council of Europe (1981). This recommendation recognises that legal proceedings are often complex, lengthy, and expensive. Therefore, governments are encouraged to take measures to simplify, expedite, and reduce the cost of court proceedings. This can be achieved through measures such as conciliation or amicable settlement of disputes.
2. Committee of Ministers of the Council of Europe (1986) This recommendation states that it is advisable to include in the judicial policy the promotion of reconciliation of the parties both outside the judicial system and before and during the trial, in order to reduce the workload of the courts, reduce unnecessary jobs, improve the quality of justice.
3. Committee of Ministers of the Council of Europe. (2002). The purpose of this Recommendation is to clarify the meaning of the term "civil matters", which refers to cases involving civil rights and obligations, including commercial, consumer, and labour law cases.
4. Directive on certain aspects of mediation in civil cases and commercial affairs (2008). The purpose of this directive is to facilitate access to dispute resolution through mediation and to ensure a balance between court proceedings and mediation.

5. Committee of Ministers of the Council of Europe. (1998).

In accordance with international and European legislation, the most common alternative forms of conflict resolution in the labour sphere are as follows:

– reconciliation through conciliation procedures;
– mediation;
– direct negotiations;
– arbitration procedures (Butynska, 2020).

The specificity of using such forms of labour dispute resolution is that “the use of one of the procedures does not exclude the possibility of using another option for resolving a labour dispute” (Burak, 2017).

1. Reconciliation

Conciliation is an alternative “method of resolving a labour dispute, which consists in finding a solution mutually acceptable to the parties through negotiation, mediation, conciliation, or other procedure. It is an effective means of reaching a compromise between the parties if all possibilities not prohibited by law are properly used” (Burak, 2017). The essence of reconciliation lies in its restorative function aimed at “bringing social relations back to the state in which such relations were before their violation” (Enykeev, 1996).

2. Mediation

Al-Khafaji (2021). notes that mediation before it became a legal means of dispute resolution, was a social phenomenon. Mediation was inherent in societies in ancient and modern history. It has played a very important role in the organisation of social relations for thousands of years.

Mediation in the context of dispute resolution is defined as any process in which the parties ask another person, called a mediator, to assist them in their attempts to resolve a dispute between them regarding contractual or non-contractual legal relations, without the mediator having the power to impose a resolution of the dispute (Şimşek, Bölten; 2017).

The peculiarity of mediation in resolving labour conflicts is voluntary. Labour disputes are resolved through negotiations with the participation of a mediator/mediators between the parties to the conflict in order to resolve the dispute and make a joint decision.

Mediation can resolve labour disputes faster, cheaper, and more efficiently, as negotiated conflict resolution increases the likelihood of continuing the employment relationship between the parties (Colvin, 2004).

The role of a mediator is to create conditions for dialogue, explore the real issues, and help create and evaluate options for a fair outcome accepted by both parties (Vezzulla, & Souza, 2004). The mediator does not have the right to make decisions on the conflict between the parties but helps to find and reach a mutually acceptable and voluntary solution (Zahorka, (s.f)).

Ukrainian scholars note that mediation, according to European Union legislation, is defined as “a structured process in which two or more parties voluntarily try to reach an agreement on a conflict that has arisen between them with the participation of a mediator” (Terekhov, 2019).

The main features of mediation in labour dispute resolution are:

1) The existence of three subjects - two parties to a labour dispute and a mediator who acts as a neutral participant offering his/her assistance in resolving the conflict (Lyakh, 2020).
2) The mediator's function is to help the parties resolve the conflict on their own, not to act as a judge. The mediator does not evaluate evidence and does not make any decisions (Stratiuk, 2019).
3) Flexibility and informal nature of the mediation procedure.
4) The use of mediation in most cases of private law disputes.
5) Voluntary participation in the process.
6) Most often, mediation is conducted in the format of a personal meeting between the parties to the dispute and the mediator.

3. Arbitration

Arbitration, whether binding or non-binding, resembles jurisdictional dispute resolution in its procedure, as the problem is resolved by a third party, an arbitrator (Pedroso et al., 2002; Pedroso et al., 2003). Arbitration or arbitration procedures are one of the alternative ways to resolve labour disputes, the essence of which is to submit the conflict to a specially created body by the parties to the conflict (Komarov et al, 2011). By their legal nature, arbitration bodies are a kind of extrajudicial entities established in accordance with the current legislation to resolve labour disputes on behalf of the parties to the labour dispute themselves (Burak, 2017). A characteristic feature of arbitration, as well as other alternative forms of labour dispute resolution, is a voluntary process, according to which neither party can be forced to reconcile (Bondarenko, 2018).

4. Direct negotiations

Negotiations are a formalised process that "sets a specific goal, defines a range of issues, and is always implemented in specific conditions, under specific circumstances. Negotiation is the most effective and widespread way to resolve disputes around the world" (Merrills, 2005).

D. Pruitt considers negotiation as "an attempt to resolve a particular conflict of interest through peaceful dialogue and discussion of the problem. It is a specific form of social interaction and decision-making that involves two or more parties with conflicting interests and goals" (1981).

(Bondarenko, 2018) believes that negotiation is almost always present in some other alternative form, and mediation is often used as a preliminary procedure before the start of court proceedings. Negotiations are often used in mediation, mediation, arbitration, and even in court itself (settlement of a dispute with the participation of a judge) (Law of Ukraine No. 1618-IV, 2004).

Results and discussion

The analysis of the literature allowed the author to determine the effectiveness and availability of alternative forms of labour dispute resolution. The author identifies the main types of alternative labour dispute resolution methods. At the same time, in practice, the use of each type of alternative forms of labour dispute resolution differs from country to country. Therefore, in order to assess the effectiveness of each form and the possibility of its implementation and widespread use in Ukraine, it is necessary to analyse the international experience.

1. Reconciliation

A study of international experience has shown that most EU member states have enshrined the use of conciliation as a way of resolving labour disputes in legislation.

One example is the Republic of Poland, where the Labour Code (Chapter 12) provides for the possibility of implementing a conciliation procedure between the parties in the event of a labour dispute (Labor Code of the Republic of Poland, 1974). The reconciliation procedure in Poland involves reconciliation commissions, which begin their work after the employee files a complaint. The statutory deadline for settling a dispute is 14 days after the submission of the relevant application. In some cases, provided for by law, the deadline may be extended by 15 days. The purpose of the conciliation commission is to provide proposals to the parties to the conflict on how to resolve it. The commission may terminate its work if the parties fail to resolve the conflict and refer the case to the court. The Republic of Poland does not have a clear mechanism for enforcing decisions made in the course of the commission's work. If one party fails to comply with the decision, the other party may go to court.

The conciliation procedure is similar in France, where the Labour Law states that a labour dispute may be subject to conciliation. Thus, Articles 2522-1 and 2522-13 (Labor Code, 2019) provide for the possibility of conciliation in the event of a labour dispute by involving special commissions. French law defines the criteria of reasonableness regarding the duration of conciliation, but does not set a time limit for the implementation of conciliation.

2. Mediation

The adoption of legislation by European countries on the use of mediation in the resolution of labour disputes was due to the heavy burden on the judicial system. Therefore, many countries have successfully introduced mediation into the legal system as an alternative way to resolve labour disputes. France was the first country to adopt the relevant legislation. Articles 2523-1 and 2523-10 of the French Labour Code define the provisions on the use of mediation in labour conflicts (Labor Code, 2019).

Another country in which mediation as a means of resolving labour disputes is enshrined in law is Bulgaria. Art. 3 of the Law on Mediation (Bulgarian Law on Mediation, 2004) enshrines the possibility of using mediation in resolving labour disputes. Mediation is possible only with the consent of the two parties to the conflict. The peculiarities of using mediation in Bulgaria in resolving labour disputes are as follows:

1) Possibility to engage several mediators.
2) Only an impartial person may be a mediator.

3) During the mediation, the mediator determines the subject matter of the dispute and informs the parties to the conflict about the consequences of certain actions aimed at resolving the dispute.
4) If an agreement is reached, the parties sign an agreement that is binding only on the parties to the dispute.
5) The absence of clear ways in the legislation to monitor the fulfilment of the terms of the agreement concluded in case of agreement.
6) The mediation procedure may be terminated in several cases: settlement of the dispute, initiative of one or two parties to the conflict, death of a party to the dispute.
7) If the parties to the conflict fail to reach an agreement and six months have elapsed since the start of mediation, the procedure may be terminated (Terekhov, 2019).

The advantages of mediation, in comparison with other alternative forms of labour dispute resolution, are that it is the fastest and most inexpensive way to resolve disputes, which can be applied only with the mutual consent of the parties and is conducted through negotiations (Mazaraki, 2016).

(Hryn, 2022) notes that

the main feature of this procedure is its maximum autonomy, confidentiality, and voluntariness, because the decision as a result of conflict resolution comes not from the mediator, but from the parties to the conflict, and is set out in the agreement of the parties to the dispute based on the results of mediation. (p. 18).

3. Arbitration

The experience of France is interesting in terms of applying the arbitration procedure in resolving labour disputes, where the Labour Code provides for the possibility of using arbitration if it is stipulated in the employment contract. The parties may choose an arbitrator by mutual agreement and must provide access to all documents necessary for the investigation in order to resolve the conflict. The specificity of the procedure is that the decisions made by the arbitrator are binding on the parties. Therefore, this procedure is efficient, effective, and prompt. The main drawback of this procedure for resolving a labour dispute is the high cost of arbitration.

O. Terekh (2020) notes that “arbitration can be a good alternative to litigation, which usually requires significant time and effort on the part of both parties to the dispute”. The scientist believes that it is advisable to introduce such a procedure for resolving labour disputes at the legislative level in Ukraine.

4. Direct negotiations

Direct negotiations as a way to resolve labour disputes have been enshrined in Bulgarian law for quite some time. For example, the Labour Code of the Republic of Bulgaria in 1987 enshrined the possibility of negotiations between an employee and an employer in resolving labour disputes. The fact that the parties have reached an agreement is certified by a protocol, which has the same legal force as the decision of the labour dispute commission. If the management does not make any decisions within seven days of receiving a copy of the employee's application, it is considered that the employee's claim is rejected (Deineka, 2014).

UK legislation provides for direct negotiations as the first mandatory stage of labour dispute resolution. The purpose of direct negotiations is to reach a mutually acceptable agreement between the parties (Venediktov, 2017).

5. “Med-arb”

Considering various forms of labour dispute resolution and the possibility of their application in Ukraine, (Bondarenko, 2018) notes that “of all the methods of alternative dispute resolution, the most relevant for Ukraine are: negotiations, mediation, and arbitration, as well as a number of specific procedures, such as mediation”.

(Vasylyna & Hansetska, 2020) note that med-arb combines two forms, namely mediation and arbitration. This is a form of dispute resolution with the help of an arbitrator, who, if the parties fail to reach an agreement, is authorised to make a binding decision in arbitration (France, Germany, Sweden. (p. 18).

The use of mediation prior to arbitration allows the parties to personally express their comments and opinions on the possibilities of resolving the dispute under the guidance of a mediator - an experienced and qualified mediator. The advantages of mediation are the flexibility of forms and the effectiveness of labour dispute resolution, which allows achieving the best result, depending on the specifics of the conflict, circumstances, and needs of the parties.

Table 1.
Analysis of the specifics of alternative forms of labour dispute resolution.

№	A form of alternative dispute resolution	Participants of the procedure	The end result	Features	Advantages	Disadvantages
1	Reconciliation	a) the employer b) the employee; c) the Conciliation Commission.	a) peaceful resolution of the conflict - acceptance of the proposals of the conciliation commission; b) if one party fails to fulfil its obligations, the case may be referred to court.	Depending on the legislation of a particular country, time limits for reconciliation may be set. If the parties fail to reach an agreement within the specified period, the case is referred to the court.	a) participation of a neutral party - a conciliation commission that objectively assesses the circumstances and specifics of each particular labour dispute; b) an opportunity to save money on resolving labour disputes without going to court.	1) lack of guaranteed effectiveness and resolution of the labour dispute; 2) the possibility of delaying the dispute resolution process if no time limits for reconciliation are set.
2	Mediation	a) the employer b) the employee; c) mediator(s) - professional mediator.	a) settlement of the dispute and signing of the agreement; b) termination of the dispute if one or two parties to the conflict initiate the termination of negotiations or if a party to the dispute dies; c) referral of the case to court.	a) voluntary - mutual agreement of the parties to start negotiations; b) the mediator is necessarily an impartial party; c) the mediator only suggests ways to resolve the conflict and does not pronounce a verdict.	a) effectiveness b) efficiency; c) material profitability; d) flexibility and informality of the negotiation process.	a) there is no control over the fulfilment of the terms of the agreement in the event of a labour dispute; b) can be used only by mutual agreement of the parties.
3	Direct negotiations	a) the employer; b) the employee.	a) reaching an agreement between the parties to resolve the labour dispute; b) in case of failure to reach an agreement, several options are possible: - application of another type of alternative form of labour dispute resolution; - referral of the case to court.	a) can be used as the first stage of labour dispute resolution; b) does not involve third parties.	a) material efficiency; b) the ability to resolve the conflict without involving other persons and to ensure the confidentiality of the case.	a) lack of an objective view of the case by an impartial person; b) lack of guarantees of resolution of the case.
4	Arbitration	a) the employer b) the employee c) arbitrator.	a) the arbitrator makes an award that is binding on the parties.	a) formality of the procedure; b) binding nature of the decisions made by the arbitrator.	a) promptness of case resolution; b) efficiency.	a) high cost of the procedure.
5	Med-arb	a) the employer b) the employee c) an intermediary arbitrator.	a) decision-making by an intermediary arbitrator.	a) combination of two alternative forms of labour dispute resolution; b) mandatory fulfilment of the conditions set by the arbitrator for resolving the dispute.	a) efficiency and effectiveness; b) efficiency c) guarantee of fulfilment of the terms of dispute resolution.	a) high cost of the procedure.

(developed by the authors)

An analysis of international experience in the use of alternative forms of labour dispute resolution has made it possible to determine their effectiveness, financial efficiency, and promptness, as compared to the resolution of labour conflicts in court.

Each of the alternative forms of labor dispute resolution is characterized by advantages and disadvantages that determine the effectiveness and feasibility of using this particular type in a particular situation.

For example, conciliation, arbitration, mediation, and med-arb procedures for resolving labor disputes require the involvement of special commissions/outsiders (mediators), which may result in a delayed conflict resolution process. At the same time, the objectivity of the result may be increased.

Direct negotiations between the parties in resolving labor disputes do not require the involvement of third parties, but this may negatively affect the objectivity of the conflict resolution and the duration of the negotiations.

The duration of resolving a labor dispute through the use of alternative forms depends on many factors, including the availability of certain time limits, the parties' interest in resolving the dispute, and the availability of established rules and stages of the conflict resolution procedure. The cost of using alternative forms of labor dispute resolution is determined by the need to engage third-party specialists (arbitrators, mediators, conciliation commissions).

However, in Ukraine, the practice of using alternative means of resolving labour disputes is not widespread. This is due to gaps in the legislation, low public awareness of the possibilities of using alternative forms of labour dispute resolution, and unwillingness to use “peaceful” methods of conflict resolution.

With regard to Ukrainian legislation, it should be noted that in 2019 Ukraine signed the UN Convention on International Agreements to Settle Disputes through Mediation. United Nations (2019).. Subsequently, in November 2021, the government adopted the Law on Mediation No. 1875-IX (2021). According to Ukrainian law, mediation is “an out-of-court voluntary, confidential, structured procedure in which the parties, with the help of a mediator (mediators), try to prevent or resolve a conflict (dispute) through negotiations” (Law on Mediation No. 1875-IX, 2021).

At the same time, mediation is currently not a popular form of labour dispute resolution in Ukraine, unlike in European countries. The reasons for this situation are as follows:

1) The adoption of a law does not mean its successful functioning. It is still important to comprehensively refine the legislative mechanism of legal regulation and introduce the necessary legislative changes that will take into account the specifics of modern labour relations.
2) Low level of public awareness of the possibilities and benefits of using mediation as an alternative form of labour dispute resolution. The lack of awareness of citizens contributes to prejudices and stereotypes about the legal approaches of this form of conflict resolution, which leads to reluctance to use it. Therefore, it is important to raise public awareness of the benefits and effectiveness of mediation as a legal institution through an information policy aimed at shaping a positive attitude towards mediation.
3) Currently, there is a lack of qualified mediators in Ukraine, so it is particularly important to promote the training of mediators. In this regard, it is advisable to involve higher education institutions and professional associations of mediators “in the educational process of training mediators, establishing standards for training mediators, creating appropriate centres for training mediators and their accreditation” (Melnyk, 2022).

Therefore, it is important to improve legislation in terms of using alternative forms of labour dispute resolution and introducing mandatory pre-trial settlement of labour disputes. This issue should be addressed comprehensively and systematically. The following measures are advisable to introduce the use of alternative forms of labour dispute resolution:

1) Amendments to the Labour Code of Ukraine and laws regulating the labour dispute resolution procedure, taking into account the current reality in Ukrainian society.
2) Conducting an information policy to raise public awareness of the possibilities of using such alternative forms of dispute resolution as mediation, conciliation, direct negotiations, and arbitration.
3) Promote professional training of arbitrators, mediators, and other specialists. In this regard, it is important to establish standards for training specialists, create special centres

for training and professional development, and involve higher education institutions in the training of such specialists.

4) Adopting the experience of countries that actively use alternative forms of labour dispute resolution.

Such a comprehensive approach to the introduction of alternative forms of labor dispute resolution in Ukraine will reduce the material and time costs of labor dispute resolution, reduce the burden on the judicial system, and increase the effectiveness of conflict resolution.

At the legislative level, it is advisable to establish the mandatory application of alternative forms of labor conflict resolution, which will allow to spread the practice of their use. In addition, it is important to set maximum time limits for the procedure to ensure that the labor dispute resolution process is not delayed by one of the parties.

When assessing the feasibility of introducing certain alternative forms of labor dispute resolution, it is important to pay attention to the cost of the procedure. It is determined that the main disadvantage of arbitration and mediation is the high cost of the procedure. Therefore, the possibility of implementing these forms of labor dispute resolution in Ukraine in the current conditions is quite limited.

Currently, Ukraine has introduced legislation on the use of mediation in resolving labor disputes, which may be due to the lower cost of the procedure and the popularity of its use in other countries.

At the same time, conciliation and direct negotiations are not currently used in the practice of resolving labor disputes in Ukraine. It is advisable to pay attention to these alternative forms of resolving labor conflicts and introduce them into Ukrainian practice.

The possibility of using several alternative forms of resolving labor conflicts will allow for choosing the most appropriate type (e.g., mediation, direct negotiations, or conciliation), depending on the situation.

Conclusion

The protection of the human right to work and the peaceful settlement of labour disputes are pressing issues that the international community is focused on. The urgency of these issues is caused by the consequences of the COVID-19 pandemic, economic crises, changes in labour organisation, and the impact of sociocultural changes on labour relations. Previously, labour disputes were most often resolved through court proceedings, but now alternative forms of dispute resolution are gaining popularity globally as an effective tool for resolving conflicts in the field of labour. However, this practice is not widely used in Ukraine today. Therefore, it is advisable to define the specifics of alternative forms of labour conflict resolution and analyse the international practice of their application. The purpose of the article is to determine the effective alternative forms of labour dispute resolution based on the analysis of theoretical information and practical experience of their application in the modern world and the possibility of their use in Ukraine.

The author defines the concept of labour disputes as disagreements between labour law entities on the application of labour legislation or the establishment of new working conditions, submitted to a jurisdictional or non-jurisdictional body for consideration with a view to their settlement. Labour disputes may be resolved in court or out of court. The need to use alternative mechanisms for resolving labour disputes is due to the heavy workload of the judiciary and the lengthy period of time required for a case to be considered in court. Alternative forms of labour dispute resolution are the mechanisms for resolving labour conflicts outside of court proceedings.

The author examines the specifics of the main alternative forms of labour dispute resolution: conciliation, direct negotiations, mediation, arbitration, and mediation. The author analyses the international experience of using alternative forms of labour dispute resolution on the example of France, Bulgaria, Poland, and the United Kingdom. The author identifies the main advantages of using alternative mechanisms for resolving labour disputes in comparison with the judicial procedure: promptness of conflict resolution, efficiency, and economic profitability.

The reasons why alternative forms of labour dispute resolution are not widespread in Ukraine are specified:

1) Absence of legislative regulation or failure to finalise legislation on the legal regulation of conflict resolution in the field of labour relations.

2) Low level of public awareness of the benefits and possibilities of using alternative forms of labour dispute resolution.
3) Lack of qualified specialists (arbitrators, mediators).

Effective implementation and promotion of the use of alternative forms of labour dispute resolution in Ukraine is possible through the implementation of the following measures:

1) Reforming the Labour Code of Ukraine and laws aimed at resolving labour disputes.
2) Implementation of an information policy on the possibilities of using alternative forms of labour dispute resolution to raise public awareness.
3) Professional training of specialists (arbitrators, mediators, and other professionals) by involving higher education institutions, establishing standards for training specialists, creating special training and professional development centres.
4) Adopting successful international experience.

The implementation of these measures will allow for the widespread use of alternative forms of labour dispute resolution in Ukraine, which will reduce the burden on the judicial system, speed up the process of resolving labour conflicts and increase the effectiveness of resolving labour conflicts.

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Teaching professional competence in preschool education

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Abstract

The article clarifies the theoretical foundations of the content of the teacher's professional competence; we will single out the types of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution, on which the maturity and formation of the specialist are based in professional activity. At various stages of our research, the following general scientific research methods were used: theoretical and empirical. The professional competence of the educator in the context of readiness to work in the environment of the preschool education institution was studied, its main components were substantiated; the skills that the teacher's professional competence should include are listed; the stages of formation of professional competence of future educators are shown. In accordance with the modern educational conditions of the formation of the professional competence of the teacher, the structure of the system of professional training of teachers of

Анотація

У статті з’ясовано теоретичні основи змісту професійної компетентності вихователя; виокремимо види професійної компетентності вихователя у контексті готовності до роботи в середовищі закладу дошкільної освіти на яких ґрунтується в професійній діяльності зрілість і сформованість фахівця. На різних етапах нашого дослідження застосовувалися такі загальнонаукові методи дослідження: теоретичні та емпіричні. Досліджено професійну компетентність вихователя у контексті готовності до роботи в середовищі закладу дошкільної освіти обґрунтовано її основні компоненти; перераховано вміння, які повинна включати професійна компетентність вихователя; показано етапи становлення професійної компетентності майбутніх вихователів. Відповідно до сучасних освітніх умов формування професійної компетентності вихователя розглянуто структуру системи професійної підготовки вихователів закладів дошкільної освіти. Під час експериментального

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preschool education institutions is considered. During an experimental study (we surveyed students of pedagogical specialties), we discovered the effectiveness of using Wiki-technologies for the formation of the professional competence of an educator in the context of readiness to work in the environment of a preschool educational institution.

Keywords: formation of professional competence of a teacher in a higher education institution, readiness for work, preschool education institutions, Wiki technology, digital technologies.

дослідження (ми проводили анкетування студентів педагогічних спеціальностей) ми виявили ефективність використання Wiki-технологій для формування професійної компетентності вихователя в контексті готовності до роботи в середовищі дошкільного навчального закладу.

Ключові слова: формування професійної компетентності вихователя у закладі вищої освіти, готовність до роботи, заклади дошкільної освіти, Wiki-технологія, цифрові технології.

Introduction

Civilizational challenges of modern times generally require significant changes in the system of training specialists. Special importance in the world education policy is attached to the activity of the teacher because it is the teacher who implements the state policy of the development of national science, the creation of the spiritual and intellectual potential of the nation, and the development of personality culture. The formation of an innovative modern education system provides an opportunity for the development of all education systems, for the preparation of a new generation of teachers, in particular for the preschool education system, where there is also an update of the content, a restructuring of the interaction in the "educator-preschooler" system.

In the system of preschool education, innovative educational directions make high demands on the professional competence of the educator, requiring a new type of teacher. In the life of society, stable and long-term progress is impossible without changing the attitude towards the formation of professionals in the first, preschool, is the most important link of education. Because the child's cognitive interests will be formed at an early age, so he will continue to work on the improvement of the entire state in general and his own intelligence, in particular Yurii Kalichak (2018), throughout his life.

Because preschool education is an important emphasis in the healthy psychophysiological development of children, and their upbringing and is an important stage in the life of every individual, we note that this process, at the first stage of a child's life, is the responsibility of both teachers and parents with whom the child communicates directly to the period of youth, starting from an early age. Therefore, for the effective and efficient upbringing and education of preschool children, it is necessary to ensure professional quality training of future preschool teachers, providing them with advanced theoretical knowledge for future pedagogical activities and providing opportunities for their innovative practical training, because preschool children need such a qualified teacher, which will ensure an effective educational process in a preschool education institution (Bezliudna & Muzyka, 2023).

Therefore, in connection with the need to train a competitive, competent specialist for further effective work in the dynamically changing conditions of a children's educational institution, who will be able to independently solve professional tasks, creatively approach their solution, will be ready for self-improvement and constant self-education, we believe that he has the professional competence of the teacher should be formed in the context of readiness to work in the environment of the preschool education institution. And this is the main task of modern higher education.

In the article, we considered the main issues, such as:

1. Theoretical foundations of the content of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution.
2. Types of professional competence.
3. The main components of a teacher's professional competence.
4. Basic skills are inherent in the professional competence of the educator in the context of readiness for work.
5. Stages of the process of developing the professional competence of future educators.

6. The structure of the system of professional training of teachers of preschool education institutions.
7. Finding out the level of readiness of future educators of preschool education institutions for partnership interaction is a necessary condition for the formation of the professional competence of a specialist in the context of his readiness to work in the environment of a preschool education institution.
8. Determination of the state of formation of the teacher's professional competence in the context of readiness to work in the environment of the preschool education institution.
9. Implementation of information and communication technologies, modern digital technologies, use of convenient and effective information and communication technology services, one of which is Wiki technology, in the educational process of the institution of higher education to form the professional competence of the educator.
10. The effectiveness of using Wiki technologies for the formation of the professional competence of an educator in the context of readiness to work in the environment of a preschool education institution.

Literature review

Global changes taking place in the world lead to the restructuring of views, habits, psychology, beliefs, social roles, and moral values of future teachers of preschool education institutions. Therefore, it is timely, in the format of the implementation of psychological and pedagogical support for educators, to consider the change of emphasis in the paradigm of work with the pedagogical staff of preschool education in the conditions of the modernization of the education system T. Telychko (2020). The author established that psychological and pedagogical support necessarily involves interaction and cooperation and is a complete, continuous process. The main components (psychological and organizational-educational (pedagogical) of psychological-pedagogical support of professional training of future educators are singled out. For the professional training of future teachers of preschool education institutions, a program of psychological and pedagogical support has been developed, which contributes to the motivation of achieving success, increasing the tolerance of a specialist, forming ideas about oneself as a successful person, career orientations, and reducing resistance. The system of principles and methods of organization and construction of practical and theoretical activities is disclosed.

L. Zdanevych, O. Kurylo, & O. Popovych (2019) devoted their research to the problems of developing the creative potential of future educators and the training of future specialists in preschool education institutions. The important tasks of higher education institutions regarding the development of the creative personality of the teacher of the preschool education institution to develop the creative personality of the preschool child are singled out. The means, techniques, and methods of scientific research, with the help of which the future specialist receives new knowledge about real reality, are listed.

The analysis of the content of the concepts "competence" and "competence", their components, and their essential application can be seen in the works of many scientists. O. Koshil (2018), taking into account the definitions of the basic concepts "competence", "competence", and "design", examines the concept of "project competence" and shows future educators the features and algorithm of the formation of project competence in the process of professional training. For the formation of project competence in future educators, automatic content and technological support have been developed, which effectively affects the specified process. Reveals the essence of the concept of "professional competence of a preschool teacher" by L. Mashkina (2019) and substantiates the main components of professional competence, describing the stages of formation of this competence. The importance of communicative, developmental, prognostic, diagnostic, and other types of competencies for the educator of preschool children is shown. The role of the main components of professional competence is shown: substantive, motivational, reflective, personal, etc. The stages of formation of professional competence of future educators of preschool children are described during the educational process. The content and ways of forming the professional competence of preschool education specialists were considered by Yu. Kalichak (2018). The author defines the components of professional competence; innovative approaches to the organization of professional training of future educators of preschool children were analyzed; taking into account the latest approaches to raising children, the conditions for their creative self-realization in the field of preschool education are substantiated. The impact of modern concepts of preschool education on the training of highly qualified specialists is shown, effective approaches to the organization of the educational process in preschool education institutions are substantiated: personally oriented, competence-based, and activity-based. The content of the concepts and methods of science is revealed, and their scope of application is shown.

Scientists K. Shovsh, O. Bida, & A. Margitych (2022) raise topical issues of professional training of future preschool education specialists. In the professional training of educators of preschool education institutions, the authors show ways of developing new approaches to the methods and technologies of professional training of future educators and outline the components of the formation of professional qualities of professional training of future educators. Qualitative training of a preschool teacher includes interdisciplinary and intra-disciplinary integration, implementation of personal activity, and systemic approaches. The essence of the approaches to the organization of the educational process in institutions of higher pedagogical education, which are necessary for the training of preschool teachers: axiological; personally oriented; competence; humanistic; interdisciplinary; technological; and activity. Also, various approaches to the professional training of future teachers of preschool education institutions are highlighted, aspects of their development of professional and personal qualities of A. Anishchuk's (2020) personality is shown. The main principles of organizing the process of their professional training are theoretically justified for future specialists in preschool education. Attention is focused on the principle of integrability, which is the basis for improving the content of education and ensures high-quality teacher training. Effective educational technologies and stages of professional training of preschool specialists are highlighted, and the essence of the competence approach with the aim of a high level of training of a competitive specialist is revealed. Ways of learning, carrying out certain activities, methods of achieving results are shown.

To increase the level of professional training of preschool teachers, scientists suggest the use of information and communication technologies and the use of distance learning in education. In particular, O. Anisimova (2021) was offered a toolkit of information and communication technologies, participation in project activities, the creation of a joint media product, the use of electronic and mobile applications, communication using blogs, social networks, chat correspondence, the use of ICT tools in the process of emotional stability, in the work of the Discussion Club, restoration of working capacity, presentation of the results of pedagogical research in the format of a webinar, adjustments for future activities. In the system of professional training of future educators, the possibilities of using distance learning are characterized, and the components of professional training are shown: invariant, fundamental, and variable. The methods of scientific research in relation to the selected research problem are determined, as a set of defined techniques, rules, norms, methods of learning a certain object or phenomenon.

In the context of professional training of future teachers to work with children of preschool age, V. Bezliudna, & Ya. Muzyka (2023) investigated and highlighted the features of the development of higher pedagogical education in the USA. Based on various approaches to the professional training of future teachers, the authors followed the stages of development and establishment of higher pedagogical education. In the context of working with preschool children, understanding the modern features of the professional training of teachers, scientific intelligence in the USA is relevant, which is useful for students, teachers, and scientists, to get acquainted with the historical context of the development of higher pedagogical education in the USA.

So, in the analyzed works, we see a timely change of emphasis in the paradigm of working with the pedagogical staff of preschool education in the context of the modernization of the education system in the format of the implementation of psychological and pedagogical support for educators. Scientists devoted their research to the problems of developing the creative potential of future educators and training future specialists of preschool education institutions. Scientists clarified the essence of the concepts "competence" and "competence", "design", "project competence", "creativity", "personality", "creative potential of an individual", "professional competence of a preschool teacher", "professional competence" and the justification of the creative potential of future educators of preschool education institutions are presented; the peculiarities of the content of pedagogical education and its structure in the USA are described, modern trends in higher pedagogical education are outlined, the influence of political and socio-economic factors on the process of professional training of educators is highlighted.

Due to the unconditional importance of modern research, the problem of the formation of professional competence among future teachers of preschool educational institutions is insufficiently researched and requires new approaches to its solution, systematization, and theoretical generalization. The formation of professional competence in the process of studying professional and professionally oriented disciplines, using computer technologies, requires special attention.

However, as evidenced by the analysis of psychological and pedagogical literature, there are no works in the modern scientific space that would systematically investigate the issue of training future teachers of preschool education institutions.

We consider such a situation unsatisfactory in terms of the scientific understanding of pedagogical problems given the public demand for the training of a new generation of teachers capable of working in an innovative educational environment, showing innovative thinking in the field of professional activity, in particular in preschool education.

The expediency of the work is also determined by the need to resolve several contradictions revealed in the research process between:

- approval of a new philosophy of education, which aims to form a personality with a high level of culture, mobility, creativity, adaptability to socio-economic changes, and insufficient awareness of the potential of educational innovations to achieve the set goal;
- recognition of the role of preschool childhood as a self-valuable stage of a person's life, during which not only prerequisites are formed, but also leading personality traits that will determine his direction, behavior, and activities throughout his life, and the dominance of stereotypes in the choice of content, forms, methods, technologies of education and education of preschool children;
- a social order to create an innovative educational and educational environment for preschool education and the real state of readiness of preschool teachers to solve this problem;
- the need for modern pedagogical practice to ensure the preparation of future teachers of preschool institutions for professional competence and the lack of a substantiated scientific and methodological system that would ensure the formation of the readiness of future educators for innovative pedagogical activities at the stage of obtaining professional education.

So, the relevance, theoretical and practical significance of the problem of professional competence of future preschool teachers, its insufficient scientific development, as well as the need to resolve the identified contradictions determined the choice of the topic of our article.

The aim of the study. Identification of ways of forming the professional competence of the educator in the context of readiness to work in the environment of the preschool education institution.

Methodology

The research was carried out using a mixed approach, with quantitative and qualitative methods: theoretical – elaboration of methodological provisions of scientific sources for clarification, comparison, systematization of theoretical bases and concepts of research, to determine the state of solving the problem of the formation of professional competence of the educator; to analyze and clarify the practical work of institutions of higher education in order to identify the level of formation of the professional competence of the educator in the context of readiness to work in the environment of the preschool education institution; design of technologies, content, forms, methods of formation of professional competence of the educator; analysis and synthesis to determine the formation of the educator's professional competence, the development of the educator's creative potential; distinguishing the types of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution, on which the professional maturity and formation of the specialist is based; examination of the process of formation of professional competence of future educators and substantiation of its main components; empirical – questionnaires, interviews to find out the level of readiness of future educators of preschool education institutions for partnership interaction, which is a necessary condition for the formation of professional competence of a specialist; determination of the state of formation of the educator's professional competence in the context of readiness to work in the environment of the preschool education institution; a written and oral survey to investigate the effectiveness of using Wiki technologies to form the professional competence of an educator in the context of readiness to work in the environment of a preschool education institution and pedagogical design to study the patterns of development of the educational process; a pedagogical experiment with the aim of identifying the level of formation of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution.

A pedagogical experiment was carried out to evaluate the level of preparation of future educators for collaborative interaction. The survey covered 156 people who obtained a degree in higher education "Bachelor".

Students in the 1st year of study showed the following levels: 8.57% of respondents have a highly formed level of readiness for partnership interaction, 53.82% have a sufficient level, 32.58% have a contradictory level, and 5.03% have an initial level. In the 2nd year of study, there is an increase in the number of higher education graduates with a highly developed level. In the 3rd year of training, the indicators of readiness for partnership interaction are as follows: 8.93% of respondents have a highly formed level of readiness, 51.98% have a sufficient level, 32.89% have a contradictory level, and 6.2% have an initial level. In the 4th year, respondents showed the following results: 7.84% of respondents have a highly formed level, 54.28% have a sufficient level of readiness for partnership interaction, 32.89% have a conflicting level and 4.99% have an initial level. Therefore, during 4 years of study, indicators of readiness of future teachers of preschool education institutions for partnership interaction changed insignificantly.

During the experimental study, a questionnaire was developed for students of higher education and educators. 65 students majoring in "Preschool Education" and 23 teachers of preschool education institutions took part in the study.

Therefore, the analysis of the questionnaires showed that practicing educators and higher education students have not developed professional competence in the context of readiness to work in the environment of a preschool education institution, they are not sufficiently familiar with modern digital technologies, technological approaches, and experience difficulties in choosing practical tasks and exercises in class and practical activities.

To foster professional competence in future educators in the context of their readiness to work in the environment of a preschool education institution, we proposed the introduction of information and communication technologies, modern digital technologies into the educational process of a higher education institution, work was carried out on the application of convenient and effective information and communication services in the educational process communication technologies, one of which is Wiki technology.

Results of the survey: 64.2% of respondents have undergone adaptation to Wiki technologies; 78.3% of respondents liked using modern technologies; 88.6% of respondents are satisfied with Wiki technologies; 49.8% of respondents did not necessarily want to use Wiki technologies; 92.7% of respondents emphasize the social benefits of Wiki technologies; 89.6% of respondents are satisfied with the frequency and effectiveness of teacher communication with students; 24.2% of respondents see a negative feature of Wiki technologies; 23.1% of respondents note the information load, which is associated with an increase in the amount of homework, the need to independently process a lot of information, the use of different educational Wiki platforms by different teachers, and insufficient feedback from teachers.

During the experimental study, we found that the use of Wiki technologies is effective for the formation of the professional competence of the educator in the context of readiness to work in the environment of the preschool education institution.

The research was carried out based on activity, system, personal, and competence approaches.

The survey was conducted online using the Google Forms service, which made it possible to compile statistics for each question and track the answers received.

Results and discussion

Theoretical foundations of the content of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution.

In the professional training of future teachers of preschool education institutions, there is a need, which is caused by the development of new approaches to methods and technology in the professional training of future specialists.

An integral component of the professional training of future educators in the context of readiness to work in the environment of a preschool education institution is the formation of professional qualities, which are one of the most important factors in the professional suitability of a specialist. They not only briefly characterize the abilities of an individual, developing in the process of learning and practical training, but also organically enter into their structure (Chagovets, 2015). Today, scientists consider the training of future specialists in preschool education as a multifactorial structure, the main task of which is the formation of each student's professional skills, the professional competence of an educator, the personal meaning of activity in the context of readiness to work in the environment of a preschool education institution and the constant growth of the teacher's interest in working with children, parents, development of success in activities (Yaroslavtseva & Kuchai, 2020).

Types of professional competence.

Let's distinguish the types of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution, on which the maturity and formation of the specialist are based in a professional activity:

– socio-psychological competence is defined as the property of an individual to effectively interact with people, which aims to improve interpersonal relationships in the education system (choose adequate methods of communication, and the ability to navigate in social situations);
– in the combination of knowledge, communication skills, and non-verbal skills lies communicative competence;
– as the ability to communicate productively in the conditions determined by the existing pedagogical system, professional and pedagogical competence is considered (Bielienka, 2011).

The specified main types of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution require clarification by the peculiarities of his professional activity.

We consider the professional competence of a teacher to be the ability to act successfully in solving professional tasks based on knowledge, skills, and practical experience. "The professional competence of an educator involves a set of professional and personal qualities necessary for successful pedagogical activity" (Kalichak, 2018).

The main components of a teacher's professional competence.

Investigating the professional competence of a teacher in the context of readiness to work in the environment of a preschool education institution, we substantiate its main components (Chagovets, 2015):

– a content component aimed at promoting the successful professional activity of a teacher including educational innovations in his system of professional knowledge;
– the motivational component includes the desire to work in the preschool field, positive motivation for future activities in the field;
– the personal component includes a person's professional and personal qualities, including creativity, adaptability, empathy, flexibility, initiative, love for children, etc.;
– the operational component provides mastery of innovative pedagogical technologies and professional thinking, enables the teacher to acquire the skills to solve various pedagogical tasks and problems that are necessary for successful pedagogical work with preschool children;
– the reflective component is such a component of professional competence that enables the educator to reflect, as well as to carry out the processes of self-development, self-improvement, and self-discovery.

Basic skills inherent in the professional competence of the educator in the context of readiness for work.

The professional competence of a teacher in the context of readiness to work in the environment of a preschool education institution should include the following skills:

– creation of an atmosphere of personal communication for the educator in the context of readiness to work in the environment of the preschool education institution;
– ensuring the child's activity in various directions: physical activity, cognitive activity, speech activity, etc.;

- the ability of the educator to apply models of those types of activities in the context of readiness to work in the environment of the preschool education institution, which the preschooler needs, including educational activities, games, communication, etc (Puhach et al., 2021).

The preparation of future educators in the context of readiness to work in the environment of a preschool education institution and the formation of their professional competence is carried out during their studies at a higher education institution, which includes not only educational activities but also practical activities, i.e., the future educators undergo various types of pedagogical practice and auxiliary sources acquisition of professional skills, knowledge, skills (attending seminars, trainings, conferences, reading additional literature, etc.) (Ivanchuk et al., 2023).

Stages of the process of developing the professional competence of future educators.

The process of developing the professional competence of future educators in the context of readiness to work in the environment of a preschool education institution consists of several stages.

1. stage. The student acquires the basis of professional competence in the first years of study, mastering certain motivational and basic knowledge, and informational components, in particular from professional disciplines.
2. stage. The process of developing the professional competence of future educators is carried out thanks to the development of psychological and pedagogical, general cultural, communicative, creative competencies (Holovan, 2008).
3. stage. Realization of professional needs takes place, the knowledge of educators is deepened and systematized in the context of readiness to work in the environment of a preschool education institution.

4th stage. Formation of professional competence of future educators in the context of readiness to work in the environment of a preschool education institution in post-graduate education. (Mashkina, 2019).

The structure of the system of professional training of teachers of preschool education institutions.

By the modern educational conditions of the formation of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution, we will consider the structure of the system of professional training of teachers of preschool education institutions.

It consists of three interconnected (fundamental, invariant, variable) structural elements.

The modern educational model of three constituent structural elements (three-subject relations) involves the introduction of a third subject of the information and communication pedagogical environment into the traditional educational model (teacher and learner). In this way, an innovative system of fundamental professional training is formed: "teacher – learner – information and communication pedagogical environment", in which all components are equal active subjects of the educational process, which is the first constituent structural element. The information and communication pedagogical environment changes the functions and roles of all subjects of education, taking over their functions in fundamental training. It is the task of the fundamental training of the educator in the context of readiness to work in the environment of the preschool education institution that is to ensure optimal conditions for the education of multifaceted and flexible scientific thinking, mastering the modern methodology of understanding reality and the scientific information base, creating an internal need for self-development and self-education throughout life.

The second constituent structural element is invariance (characterized by significant stereotypy, and stability), dominated by: a focus on preserving traditions, independence from external influences; convergence and integrability of processes, their generalization and integrity; desire for order and heredity; and insufficient flexibility (Ratsul et al., 2017).

The third component is variability: innovative orientation, flexibility, accessibility to new technologies and sciences; dynamics and differentiation of internal processes, their divergence, specificity, and dismemberment; the dominance of differentiated knowledge; dependence and instability from external changes. All three component structures of the system of professional training of preschool teachers are closely interconnected. A separate element, its quality affects the general indicator of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution (Bida et al., 2019).

We see the implementation of the structural components of the system of professional training of preschool teachers in the acquisition of soft skills that will help the future teacher to improve his level of professionalism. This is a lifelong process of dynamic personality transformation (Anisimova, 2021).

Finding out the level of readiness of future educators of preschool education institutions for partnership interaction, which is a necessary condition for the formation of professional competence of a specialist in the context of his readiness to work in the environment of a preschool education institution.

The level of mastery of each, considered by us, the component of the balanced system of professional training of teachers of preschool education institutions makes it possible to determine partnership interaction, which is a necessary condition for the formation of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution.

Therefore, we conducted research at the Faculty of Pedagogy. Purpose: to find out the level of readiness of future educators of preschool education institutions for partnership interaction.

The survey covered 156 people who obtained a bachelor's degree.

We present the obtained results:

Students in the 1st year of study showed the following levels: 8.57% of respondents have a highly formed level of readiness for partnership interaction, 53.82% have a sufficient level, 32.58% have a contradictory level, and 5.03% have an initial level.

In the 2nd year of study, there is an increase in the number of higher education graduates with a highly developed level: 10.94%. But at the same time, we observe a decrease in respondents to 47.92% of those who have a sufficient level of readiness for partnership interaction; 35.5% of respondents with a conflicting level of readiness for partnership interaction, and 5.64% of respondents with an initial level of readiness for partnership interaction.

In the 3rd year of study, the indicators of readiness for partnership interaction are as follows: 8.93% of respondents have a highly formed level of readiness, 51.98% have a sufficient level of readiness for partnership interaction, 32.89% have a contradictory level of readiness for partnership interaction, 6.2% have the initial level of readiness for partnership interaction.

In the 4th year, respondents demonstrated the following results: 7.84% of respondents have a highly formed level of readiness for partnership interaction, 54.28% have a sufficient level of readiness for partnership interaction, 32.89% have a contradictory level of readiness for partnership interaction, and 4.99% have the initial level of readiness for partnership interaction. Therefore, during 4 years of study, indicators of readiness of future teachers of preschool education institutions for partnership interaction changed insignificantly.

An analysis of possible reasons why students do not experience a significant increase in the level of preparation for joint interaction during 4 years of study is made. Students show some frustration with the practical component of their profession. During the survey, higher education seekers expressed a discrepancy between the expectations of partnership interaction at the stage of admission to the institution of higher education and the state of real professional training. We suggest that in institutions of higher education, not enough attention is paid to partnership interaction on the part of teachers, which is unacceptable in the further professional activity of future teachers of preschool education institutions. Therefore, it is worth paying attention to the issue of partner interaction when studying at a higher education institution, during the academic period, which is favorable for consolidating knowledge, improving skills, and developing partner interaction skills. Based on the results of the research, we affirm the necessary development of a working system for the formation of future educators of preschool education institutions of the qualities necessary for effective professional activity.

Determination of the state of formation of the teacher's professional competence in the context of readiness to work in the environment of the preschool education institution.

During the experimental study, a questionnaire was developed for students of higher education and educators. 65 students majoring in "Preschool Education" and 23 teachers of preschool education institutions took part in the study.

The following results were obtained.

The majority (57.8%) of educators and (71.6%) of students answered the question of the questionnaire "How do you understand the concept of "professional competence of an educator": not exactly and not specifically, educators and students of higher education have a generalized idea about the essence of the concept.

The question of the questionnaire "What innovative techniques and methods of work do you use with children for their development?" was aimed at finding out the innovativeness of the teacher's work. The obtained results are as follows: 77.3% of educators use creative tasks, didactic games, and handouts (illustrations, visualization); 28.2% use schematic teaching aids in their work; and only 11.9% of educators use digital technologies in their work with children. Students' answers varied. In addition to the mentioned techniques and work methods, they used in practice: simulation of game situations (64.2%), interactive forms of work (49.9%), project method with children of older preschool age (42.4%)), only 14.5% used digital technologies when working with children.

To the question "Which tasks, in your opinion, ensure the formation of a teacher's professional competence in the context of readiness to work in the environment of a preschool education institution," the answers of teachers and students of higher education practically did not differ. 48.7% of respondents noted that this is a task that develops thinking; 32.3% pointed to tasks that activate mental activity; 47.5% noted the significance of game tasks for the ability to compare, analyze, compare situations and objects; 22.3% pointed to tasks with clearly developed action algorithms; 14.5% showed exercises for the development of intelligence and thinking; the use of digital technologies was indicated by 17.9% of respondents. The analysis of the questionnaires shows that practicing educators and students of higher education during practice use traditional forms of working with children do not sufficiently use online platforms for the educational process, and are not sufficiently familiar with modern digital methods of child development.

The next question of the questionnaire asked to find out what difficulties higher education students and teachers of children's institutions face when preparing for classes with preschool children. The analysis of questionnaires showed that 47.3% of educators and 65.7% of higher education students experience difficulties in choosing practical tasks for children; 27.8% of educators and 44.2% of students of higher education find it difficult to motivate children to work in class and interest children in performing the proposed tasks; 18.3% of educators and 21.2% of students of higher education experience difficulties in being able to explain the material to children in a comprehensible and understandable way; 11.2% of educators and 7.2% of higher education students answered that they experienced difficulties in the older group in conducting classes with children.

Therefore, the analysis of the questionnaires showed that practicing educators and higher education students have not developed professional competence in the context of readiness to work in the environment of a preschool education institution, they are not sufficiently familiar with modern digital technologies, technological approaches, and experience difficulties in choosing practical tasks and exercises in class and practical activities.

In addition, the difficulties faced by students and teachers during preparation for classes were discussed.

- inability to reconcile one's own actions with the actions of other people;
- inability to adjust the content and forms of partner interaction under the goal of partner interaction;
- insufficient formation of a person's volitional sphere, communicative and organizational abilities;
- assertiveness of behavior, the ability to appropriately say "no" without insulting the opponent, make demands and constructively conduct dialogue; make a request, etc.

Implementation of information and communication technologies, modern digital technologies, use of convenient and effective information and communication technology services, one of which is Wiki technology, in the educational process of the institution of higher education to form the professional competence of the educator.

To foster professional competence in future educators in the context of their readiness to work in the environment of a preschool education institution, we proposed the introduction of information and communication technologies, modern digital technologies into the educational process of a higher education institution, work was carried out on the application of convenient and effective information and communication services in the educational process communication technologies, one of which is Wiki technology (Kravchenko et al., 2022).

The use of information and communication technologies can automate information processing, provide access to reliable sources of information, accelerate optimal decision-making, and relieve a person of routine work in all areas of human activity. Such a process is the driving force of the development of society. The Internet becomes a necessary environment for a person, where the modern educational process is carried out, and it expands the framework of the educational process of using information and communication technologies. The most effective and convenient information and communication technology service is Wiki technology. "Wiki technology is a tool for rapid creation and editing of collective hypertext. Wiki technology maintains links between different pages by intuitively creating links to other pages and displaying whether those pages exist. Wiki technology aims to engage visitors in a continuous process of creation and collaboration that constantly changes the appearance of the site. Wiki technology brings to the educational process such pedagogical forms and methods as cooperative learning, discussions, role-playing and business games, situational analysis, the project method, etc. (Lystopad et al., 2023).

Wiki technologies give greater freedom to students of higher education and teachers, allowing them to expand the independent work of students of higher education and teachers to use creative approaches in teaching; provide an opportunity to use this service in classes, to create creative collective projects within the educational group, projects with participants of other educational groups, where the interaction of the teacher and students is at the center of the educational process.

Therefore, for the formation of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution, digitalization of education must become an effective tool in his future professional activity, without weakening communication skills; without complicating his life in the profession; allowing to intensify work with preschool children (Lystopad et al., 2023).

Research on the effectiveness of using Wiki technologies for the formation of the professional competence of an educator in the context of readiness to work in the environment of a preschool education institution.

To investigate the effectiveness of using Wiki technologies for the formation of the teacher's professional competence in the context of readiness to work in the environment of a preschool education institution, and to identify the degree of satisfaction with the Wiki technologies format, a questionnaire was conducted among students of pedagogical specialties.

The survey was conducted online using the Google Forms service, which made it possible to compile statistics for each question and track the answers received. The questions were developed to determine the effectiveness of using Wiki technologies.

Survey results:

64.2% of respondents were adapted to Wiki technologies;
78.3% of respondents liked to use modern technologies, to work together in a team, to be able to make changes to the site;
88.6% of respondents are satisfied with Wiki technologies;
49.8% of respondents did not necessarily want to use Wiki technologies when studying all educational disciplines, other respondents had the opposite opinion (Wiki technologies should necessarily be used);
92.7% of respondents emphasize the social benefits of Wiki technologies;
89.6% of respondents are satisfied with the frequency and effectiveness of teacher communication with students;
24.2% of respondents see a negative feature of Wiki technologies (reduction of eye contact, live communication, personal attention of the teacher,

social interaction with teachers and other students of higher education, student group atmosphere);
23.1% of respondents note the information load, which is associated with an increase in the amount of homework, the need to independently process a lot of information, the use of different educational Wiki platforms by different teachers, and insufficient feedback from teachers. "This problem can be solved with the help of online consultations and closer communication with teachers through messengers. The main advantage of Wiki projects is that the quality of the content is controlled by the virtual community" (Lystopad et al., 2023) surveyed students of pedagogical specialties.

We have analyzed the advantages and disadvantages of using Wiki-technologies in the formation of the professional competence of educators.

As a result, the most effective advantages of Wiki technologies for the formation of professional competence of educators are highlighted. This is primarily: implementation of effective information interaction; creation of an effective educational information environment for the formation of professional competence of educators based on Wiki technology; organization of effective management and pedagogical supervision; providing access to information resources for all participants in the educational process; formation of network communities.

Disadvantages of using Wiki-technologies in the formation of professional competence of educators: privacy issues; copyright and intellectual property; the unreliability of information; the impossibility of structuring; duplication of information; with the help of a text communication channel, making it difficult to express emotions; psychological problems of Internet communication: aggression in the network, Internet addiction, etc.

Conclusions

We clarified the theoretical foundations of the content of the teacher's professional competence; let's distinguish the types of professional competence of the educator in the context of readiness to work in the environment of the preschool education institution, on which the maturity and formation of the specialist are based in professional activity.

The professional competence of the educator in the context of readiness to work in the environment of the preschool education institution was studied, and its main components were substantiated.

The skills that should include the professional competence of an educator are listed; the stages of formation of professional competence of future educators in the context of readiness to work in the environment of a preschool education institution are shown.

By the modern educational conditions of the formation of the professional competence of the teacher, the structure of the system of professional training of teachers of preschool education institutions is considered. The level of readiness of future educators of preschool education institutions for partnership interaction, which is a necessary condition for the formation of professional competence of a specialist in the context of his readiness to work in the environment of a preschool education institution, has been clarified.

The state of formation of the educator's professional competence in the context of his readiness for work is clarified.

The importance of introducing into the educational process of a higher education institution: information and communication technologies, modern digital technologies, and the use of convenient and effective services of information and communication technologies, one of which is Wiki technology to form the professional competence of an educator, is shown.

A study of the effectiveness of the use of Wiki technologies for the formation of the professional competence of the educator in the context of readiness to work in the environment of the preschool education institution was conducted.

We have formulated recommendations for improving the professional competence of educators: formation of a flexible system of continuous teacher education; formation of a methodical environment for educators; professional interaction with colleagues, participation in group and collective innovative forms of methodological work; the educator's innovative approach to improving the level of professional competence; self-educational activity (planned and episodic) of the educator with the aim of improving professional competence; compilation of the educator's creative portfolio; self-development, self-education, self-improvement of professional competence; reflection of own activity; creation of an informational and educational space for improving the professional competence of educators with equal access of all educators to informational and educational resources; readiness of educators for innovative activities, priority of educational technologies; organization of research and research work of educators with the aim of improving professional competence; raising the cultural and general educational levels of educators.

Further work will be focused on the practice of using collaborative learning, in which students of higher education study in groups, cooperate, and discuss issues with students and teachers, which develops teamwork skills, communication skills, and the ability to self-develop.

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Influence of educational environment on the formation of skills among future professionals

Вплив освітнього середовища на формування вмінь і навичок майбутніх фахівців

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Abstract

This research aims to explore the impact of educational environment factors within higher education institutions on the process of shaping professional (Hard Skills) and social competencies (Soft Skills) of future professionals. The proposed study falls within the realm of mixed-method scientific inquiry, as it encompasses the synthesis of theoretical analysis of scholarly concepts relevant to the article's core ideas, a factor analysis of empirical data collected to quantify the influence of external and internal educational environment factors, as well as qualitative generalizations drawn from the results of the factor analysis. Empirical data collection was conducted through the observation of a student group (n = 925) utilizing methods such as surveys, questionnaires, testing, and interviews. The findings of this research are valuable for informing the implementation of models for

Анотація

Проблемою дослідження є визначення впливовості факторів едукаційного середовища закладу вищої освіти на процес формування професійних (Hard Skills) і соціальних компетентностей (Soft Skills) майбутніх фахівців. Дослідження, що пропонується, належить до наукових розвідок змішаного типу, оскільки містить узагальнення, засновані на теоретичному аналізі наукових положень щодо сутності ключових понять статті, факторний аналіз емпіричних даних, які виміряні для кількісної характеристики впливу чинників зовнішнього та внутрішнього освітнього середовища, якісні узагальнення результатів факторного аналізу. Збір емпіричних даних здійснювався у процесі спостереження за групою студентів (n = 925): опитування, анкетування, тестування, інтерв'ювання. Результати дослідження доцільно врахувати у процесі реалізації моделі

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graduates of higher education institutions. The study revealed that future professionals are expected to have not only hard skills but also develop soft skills, the formation of which should occur in parallel.

Keywords: higher education institution, professional, educational environment, factor, competence, professional competence, social competence.

випускників закладів вищої освіти. Дослідження показало, що майбутні фахівці повинні володіти не тільки професійними навичками, а й розвивати м'які навички, формування яких має відбуватися паралельно.

Ключові слова: заклад вищої освіти, фахівець, освітнє середовище, фактор, компетентність, професійна, соціальна компетентність.

Introduction

The social environment plays a crucial role in determining an individual's system of values, personal orientation, behavioural norms, and serves as a source of acquiring both professional and social experience. The educational environment within educational institutions is considered a subsystem of the broader social environment. It exerts both regular, organized, and spontaneous, often unpredictable influences on educational actors due to a multitude of diverse material and immaterial factors (Budnyk & Sydoriv, 2019).

In its general characteristics, the educational environment can be defined as a set of specific conditions that facilitate the realization of an individual's right to education (Article 59 of the Ukrainian Constitution).

The purpose of this article is to clarify the essence, structure, and potential of the educational environment within higher education institutions concerning the development of specific social and professional competencies of future professionals, the acquisition of which ensures their professional readiness to perform their functions.

The formulated objective outlines the tasks related to:

1) refining the model of a higher education institution graduate as a combination of social and professional competencies;
2) defining the essential characteristics of the educational environment within higher education institutions;
3) investigating the structure of the educational environment within higher education institutions;
4) identifying the resources within the educational environment as a systemic whole and a collection of individual components in the context of shaping the professional competency of a future professional.

The content of a professional's skills (Hard Skills) and social characteristics (Soft Skills) depends on the profile of their professional training. For instance, Hard Skills encompass abilities such as typing on a computer, driving a vehicle, technical operation of machinery, reading, arithmetic calculations, algebraic transformations, mathematical presentations, technical translation, and the use of computer programs, among others. Hard Skills are subject to measurement through valid diagnostic procedures, enabling the determination of a specialist's qualifications.

Irrespective of the training profile and field of activity, we believe the following Soft Skills are pertinent:

– critical thinking, defined as the capacity to make appropriate decisions based on the analysis of available information;
– effective communication, which involves articulating thoughts clearly and coherently to audiences of any nature;
– emotional intelligence, encompassing the understanding of others' emotions and feelings, managing one's own emotions, and influencing the emotions of others;
– social intelligence, referring to the system of norms regarding one's relationship with the world and others, the ability to form attitudes towards oneself, anticipate the consequences of actions, and understand one's own behavior and that of others;
– problem-solving ability, involving the capacity to identify solutions, opportunities, and resources;
– inquisitiveness, characterized by an interest in seeking answers to pertinent and significant questions;
– business acumen, denoting determination in pursuing problem resolution.

These traits are more challenging to formalize and are subject to quantitative measurement.

Expert assessment and methodologies such as Emotional Intelligence (N. Hall), Social Intelligence (J. Guilford), and others are commonly used to determine the level of their development.

Theoretical framework

The pedagogical significance of the environment has been recognized by international pedagogical thinkers throughout different eras, including figures such as K. Comenius, J. Locke, I. Pestalozzi, J. J. Rousseau, J. Dewey, C. Rogers, P. Freire, E. Carlton Parsons, D. Moore, and M. Fabri. In domestic pedagogy, the understanding of the educational environment has evolved from a rigid social determinism approach, as exemplified by A. Makarenko, to one that emphasizes the promotion of individual freedom and self-development, as advocated by O. Zakharenko and V. Sukhomlynsky.

In contemporary pedagogical thought, the concept of the “educational environment” is used as a composite category that represents a structural component of a particular socio-pedagogical system (O. Harkovych, R. Hurevych, L. Ibragimova, V. Ilyina, M. Karpenko, etc.). They conceive the educational environment as:

1) a collection of historical conditions and circumstances;
2) a subsystem of the socio-cultural environment;
3) a sub-space within the broader socio-informational context;
4) an integrated, specifically organized pedagogical system for socialization and personality development.

In its broadest sense, the educational environment encompasses a diverse, multilayered world that surrounds individuals, shaping their perceptions of the world, attitudes towards people, nature, and their surroundings. As aptly noted by L. Necheporenko, environmentalism (from the English “environment”) is the entire world: earth, atmosphere, biosphere, and noosphere. In a narrower sense, it refers to the local environment of an educational institution, integrating the educational process, the content of educational materials, and the interaction of educational actors within a specific pedagogical space. The educational environment of higher education institutions serves as a microcosm that “remains one of the few opportunities to glimpse into the vast universe of humanity, which must learn to build new solidarity among its members” (Juszczyk, 2007).

It is important to note that the pedagogical potential of the educational environment in higher education lies in its ability to transform external influences into the internal structure of the individual. It creates favourable conditions for comprehensive personal development and self-improvement, instils ethical and aesthetic values in educational actors, facilitates the dissemination of new professional, cultural, and corporate values, stimulates group interests, enhances interpersonal relationships, and assists in the acquisition of social experience and the development of qualities necessary for life and professional activities.

The educational environment in higher education institutions provides students with the opportunity to acquire both general (key) and professional competencies in humanities, social sciences, natural sciences, and engineering and technology fields, essential for professional practice and their intellectual, moral, spiritual, aesthetic, and physical development.

Methodology

Research Background

The research methodology is grounded in the theoretical analysis of scientific works relevant to the addressed problem, synthesis, generalization, modelling, and formalization to formulate theoretical conclusions and predictive propositions. It also involves empirical investigations and the processing of their results, as factor analysis to ascertain the significance of identified factors within the educational environment of higher education institutions in shaping specific socio-professional phenomena in future professionals.

The factor-analytic method is based on the notion of the comprehensive nature of the phenomenon under study, as manifested in the relationships among its characteristics. The goal of factor analysis is to transform the initial information, initially presented in the form of a data array, into a concentrated set of the most essential characteristics, which are the factors.

The primary results of factor analysis are expressed in factor loadings, factor fields, factor weights, and eigenvalues of the factors. Factor loadings represent the correlation coefficients between each of the analyzed variables and each of the extracted factors. The closer the connection between a variable and a factor, the higher its factor loading. A positive sign of a factor loading indicates a direct relationship with the factor, while a negative sign indicates an inverse one. Factor loadings are presented in the form of a table with rows equal to the number of analyzed variables (columns in the original data matrix) and columns equal to the number of extracted factors. From a matrix algebra perspective, the matrix of factor loadings is transposed to the original data matrix.

The extraction of factors can be carried out based on the study of a factor analysis outcome called factor weights. Factor weights are quantitative values representing the connection between the extracted factors and the objects. Objects with higher factor weights are characterized by a higher level of manifestation of the properties of the extracted factor (a stronger connection with the factor). Positive factor weights correspond to objects with a level of manifestation of the factor's properties above average, while negative factor weights correspond to objects with a level below average. The table of factor weights contains rows equal to the number of objects under study and columns equal to the number of extracted factors.

To determine the social characteristics of future professionals in the study, methods such as "Emotional Intelligence" (N. Hall), "Social Intelligence" (J. Guilford), "Level of Subjective Control", "Value Compatibility and Accessibility", "Color Test of Attitudes" (E.F. Bazhin, O.M. Etkind), and others were utilized.

The research has established that the educational environment within higher education institutions should serve as the organizational and methodological support for the development of specific components of social and professional competence of future professionals. It constitutes a set of conditions and resources for the education and upbringing of education seekers, as well as the sphere of realization of the professional activities of pedagogical and scientific-pedagogical staff.

As a local microcosm, the educational environment within higher education institutions possesses the following characteristics:

- encompasses the socio-economic system to which the education seekers belong;
- education seekers, while having the status of temporary members of the higher education institution, constitute its variable contingent;
- the scientific-pedagogical staff is also deprived of a permanent status since they hold positions on a competitive basis;
- the higher education institution is an accountable structure with its activity goals determined by qualitative and quantitative parameters of the social-state order, and its content is represented by educational and professional programs implemented in educational complexes of academic disciplines;
- the outcomes of the higher education institution's activity have a remote nature, as the results can be evaluated some time after the completion of education;
- the educational process within higher education institutions involves a multitude of contradictions and paradoxes, including the real autonomy of higher education institutions as institutions, as stipulated by the (Law of Ukraine No. 2145-VIII) "On Education" (2017), and the limited autonomy of educators in choosing the content of education in terms of scope and structure of educational information;
- a characteristic feature of the educational environment is a system of opportunities, a variety of individual forms, and trajectories of education seekers.

Summarizing the views of researchers Bondar, Kovalenko, & Petrenko, (2023); Franiok, (2021); Kasáčová & Kosova, (2007); Baartman, & Bruijn, (2011); Yu et al., (2014), Prokopenko, (2020); the model of a graduate of a higher education institution has been characterized as a structure of personality in the form of needs and abilities, values, orientations, attitudes, necessary qualities, interests, and social attitudes. Among the essential characteristics of the graduate model, social and professional competencies were included, which encompass knowledge, skills, ways of action, life experience, predicted qualities of personality, ensuring readiness for future activities, quick adaptation to specific conditions, responsibility, initiative, a striving for improvement, self-realization, and a healthy lifestyle.

In the scientific and pedagogical discourse, the professional competence of a specialist is commonly characterized as an integral personality-professional formation, combining social-personal and special (general scientific, engineering, etc.) competencies.

The article defines the professional and socio-personal traits of future professionals, which form the basis of such an integrative formation as professional-social competence. The professional competence (Hard Skills) of a specialist will be based on the formula of the American scientist G. Lasswell: P = p d r f, (1)

Where:

P – professional competence of a specialist;
p – personal motives;
d – projection onto the object of professional activity;
r – rationalization of actions as a manifestation of professional interest;
f – transformation processes.

From the provided formula, it follows that the professional competence of a specialist is ensured by the presence of personal motives and professional interest directed towards acquiring the necessary knowledge.

These motives will be transferred to the object of professional activity in the future through transformational processes (Bathan, 2021). The special competencies of professionals of different profiles have been presented in the Table 1.

Table 1.
General Professional Competencies of Specialists

Competency Components	Knowledge	Skills	Communication	Autonomy and Responsibility
General Scientific Competencies				
Ability to apply knowledge of fundamental principles of natural-mathematical disciplines in practical activities	Knowledge of fundamental principles of higher mathematics, physical theories and laws, methods of researching physical phenomena, basics of engineering and computer graphics, basics of standardization and metrology	Ability to apply fundamental principles of higher mathematics and natural sciences when mastering the content of specialized educational disciplines in the specialization and speciality	Ability to present the results of educational, educational-research, and scientific-research activities, use software tools and skills for working in computer networks, create databases, and use Internet resources	Independent assimilation of new knowledge under conditions of innovative development
Engineering and Technical Competencies				
Mastery of technical principles of design, operation of machinery, and equipment	Knowledge of the theoretical foundations of thermodynamics, technical mechanics, and other scientific disciplines that make up the scientific basis of the respective industry, comprehensive knowledge of its component base	Ability to measure parameters of various devices, automation of control of machinery and equipment samples	Ability to interact in carrying out educational-research tasks related to the study and development of the component base, measurement of performance parameters	Independent assimilation of new knowledge under conditions of innovative development

Sourse: (Bathan, 2021)

It is important to note that the content of an integrated competency of a specialist depends on the profile of their professional training. For instance, in Table 2, examples of professional competencies for an engineering profile specialist have been provided, whereas for a future humanitarian specialist, this set will be different. The social competencies of a specialist have been presented in Table 2.

Table 2.
Social Competencies of a Specialist

Components of Competency	Knowledge	Skills	Communication	Autonomy and Responsibility
Social Competence				
Ability to participate in the activities of democratic institutions of society	Knowledge of current legislation, regulatory framework, political literacy	Ability to advocate one's position, correct mistakes, and understand the flow of political information	Ability to participate in the activities of democratic institutions of the society	Adequate assessment and responsibility for one's health, the lives and health of subordinates, and peaceful citizens
Ability to exist in a social environment	Knowledge of scientific principles of decision-making theory, current legislation, regulatory acts, philosophy, sociology, political science, economic theory, Ukrainian and foreign languages, history of Ukraine, knowledge and observance of the rights and freedoms of a Ukrainian citizen, rights and duties of an official	Ability to make managerial decisions in standard and non-standard situations, manage engineering and technical, economic activities, conduct individual and group educational work, actions to strengthen labour discipline and law and order, unite production teams, predict and resolve interpersonal conflicts	Communicativeness, the ability to organize functional-role and interpersonal interaction, tolerance, the ability to criticize and engage in self-criticism, systematic problem-solving, ability to communicate with people: oral, written, in the form of dialogue and conversation, ability to predict the development of interpersonal relations in production teams	Competencies related to the individual as a personality, a subject of activity: understanding of ethical norms of behaviour, ability to learn, carry out personal and professional self-development, and improvement. Competencies related to the social interaction of the specialist with the social sphere, and production team: ability to carry out effective professional activities in the position of manager and subordinate

Sourse: (grouped by the authors)

The social qualities of a professional can be presented as the result of the combined manifestation of such professionally important moral-ethical and emotional-volitional qualities of an individual, including:

1) empathy (the ability to empathize, share feelings, sense a person's mood, and understand their inner world);
2) tactfulness, delicacy, and attentiveness to the service recipient (paying attention to the client's mood, their well-being, adhering to the principle of "do not harm");
3) tolerance (respect for the interests, beliefs, ideals, needs, and habits of other people, accepting a person as they are, with their right to choose their way of life);
4) patience and self-control (maintaining control over one's own emotions in response to provocations such as irritability and aggressiveness);
5) high spiritual culture and morality, ethical behaviour, compassion, sensitivity, and selflessness (oriented toward the interests, needs, and protection of a client's human dignity, a willingness to help, and sympathy for others);
6) honesty (truthfulness in explaining the client's situation, possible solutions to their problems, and potential difficulties);
7) objectivity and fairness (treating clients equally, regardless of personal preferences, providing an adequate assessment of their problems);
8) moral integrity in professional matters, confidentiality (the ability to keep secrets that do not pose a threat to others);
9) integrity and responsibility (moral responsibility for one's behaviour and the consequences of one's actions);
10) positive emotional attitude towards people: friendliness, kindness, love for people, optimism (the ability to perceive a person as valuable, instilling positive feelings toward them, inspiring hope for the better).

As a rule, indicators of the level of development of these qualities are difficult to formalize or not entirely formalizable and do not lend themselves to mathematical processing or the derivation of universal laws.

For example, attempts to derive regularities in the ways of human existence that define the general parameters of life, sensory-mental experiences of an individual, determined by the existential nature of human existence, the free choice of personality, influenced by a complex of external and internal environmental factors, can be represented by the formula of "personal identity" (E. Erikson), "self-actualization" (A. Maslow), "authentic expression" (A. Waterman), "personal expression" (M. Seligman):

O = I + L + V, (2) where I – factors that determine the individualized range of comfortable perception of the surrounding environment (at least at the level of 50%), genetically determined and relatively stable throughout life;
L – life circumstances that determine the self-realization of a person by 10%;
V – factors determined by conscious actions, requiring effort, subject to volitional control, make up about 40%.

The research provides the "health formula" proposed by the author's team (Skúpa et al., 2021).

H = (ES + PA + TH + RN + OF) / (D + SM + A + OHH), (3) where H – health; ES – emotional stability; PA – physical activity; TH – thermal hardening; RN – rational nutrition; OF – other favorable factors; D – diseases; SM – smoking; A – alcohol; OHH – other harmful habits.

According to the "health formula," a person's health is directly proportional to a healthy lifestyle, possible with favourable conditions for life, education, and professional activities. Conversely, a person's health deteriorates if they have harmful habits or are in unfavourable conditions.

The above highlights the research aspects of shaping the educational environment in higher education institutions (HEIs), such as somatic (human body conditions), valeological, ecological, and ergonomic factors, taking into account which contributes to the formation of a future professional's personality through the development of functional and adaptive reserves of their organism in the educational environment.

Therefore, the professional competence of a specialist is a multifunctional concept, the formation of which, as researchers, including Y. Shapran, (Porubský et al., 2014), who associates with the creation of an appropriate educational environment. This environment allows for the modelling of various real educational and professional situations, providing an effective means of monitoring the educational activities of students in this environment. This emphasizes the characteristics of competence, such as polyfunctionality, cross-disciplinarity, and multidimensionality, the presence of which significantly expands the scope of personality development.

In the context of research on the impact of factors within the educational environment of higher education institutions (HEIs) on the development of social and professional competencies of professionals, it is pertinent to define competence as a dissipative structure of personality that expends energy in the educational and professional environment, utilizing available resources and systematically replenishing them through the renewal of knowledge, acquisition of new information, and improvement of skills and methods of activity. This perspective is echoed by O. Hura (Kozlovska et al., 2021), who notes that competence cannot be isolated from the specific conditions of its realization. The study of the educational environment is a relevant direction in contemporary research conducted by both domestic and foreign psychologists and educators.

As evidenced by the analysis of the provided "formulas," the formation of both professional and social characteristics of a professional depends significantly on the conditions of both the internal (psychological) and external (educational) environment. Scientific literature offers numerous proposals for structuring the educational environment of HEIs. Based on the research results of V. Ilyina (Antera, 2021), Donnikova, & Kovban, (2020), and our work (Kovalenko et al., 2020), we can distinguish several components within the educational environment:

1. Organizational and managerial component: This component ensures effective management of the educational-professional process, the participation of educational actors in the work of educational-methodological, educational-scientific training, scientific, socio-humanitarian, educational, and social-psychological activities, international cooperation, staffing, postgraduate education, creative teams, implementation of educational, cultural, and scientific cooperation programs with other HEIs and institutions. It involves forms and methods of organizing educational activities that facilitate the practice of applying professional skills, including independent research with

subsequent presentation of results to a group, time management skills, conflict resolution, cultural matters, and self-actualization.

2. Content and procedural component: This component primarily ensures the formation of professional competencies prescribed by educational-professional programs for specific specialities and specializations. The development of social skills is facilitated through in-depth study of foreign languages, socio-humanitarian disciplines, psychology, pedagogy, and others. Relevant educational disciplines should be included in the educational-professional programs, with a focus on teaching methods that emphasize the development of higher education seekers as competitive graduates. This component also involves expanding the worldview of students through attending classes in relevant courses and electives, as well as reading professional and literary literature.

The research demonstrates that the formation of professional and social competencies is intrinsically tied to the educational environment of HEIs. Therefore, the effective structuring and management of this environment play a crucial role in the development of competent professionals.

The communicative component of the educational environment in higher education institutions (HEIs) is oriented towards creating a comfortable moral and psychological atmosphere through the coordination of formal and interpersonal interactions based on the principles of the rule of law, mutual respect, tolerance, and the organization of student self-government and parliament. It also involves engaging students in active civic and volunteer activities, and participation in sports competitions, which primarily contribute to the development of social skills. Additionally, it entails educators imparting to students an understanding of the importance and benefits of possessing social interaction skills (Verdugo-Perona et al., 2017).

To complement the outlined structure of the educational environment in HEIs, a technological component can be introduced. This component involves the organization of an information field in which computer-based management of educational activities is carried out using a person-centered approach (Marrero-Sánchez & Vergara-Romero, 2023), (Sulym et al., 2023). This is achieved by creating a database that corresponds to each student's educational trajectory. In a mode of flexible, transparent, standardized dialogue with computers, users acquire skills in productive information search and gathering, logical and critical thinking, independent decision-making, creativity, and self-organization.

Sample

In this study, empirical data were utilized, which were obtained within the framework of the research by Borysov R. I. Motivation of educational activity as a factor of formation of educational practices of Ukrainian and Polish students: a comparative analysis. A sociological study, conducted jointly by V. N. Karazin Kharkiv National University (Kharkiv, Ukraine) and Zelenogursk University (Zelena Gura, Poland), encompassed 925 Ukrainian and Polish students.

The random nature of the sample ensures its representativeness. Dominant socio-demographic characteristics of the respondents include orientation toward future professional activity, and the financial status of young individuals, which either necessitates working to pay for education or relies on financial support from their families or the possibility of receiving additional income in the form of scholarships.

Instruments and procedures

To analyze the significance of factors related to the educational environment in shaping professional and social competence, the following indicators were investigated: the cumulative percentage of factor variance, which determines how well our dataset was described using the identified factors – the higher this indicator, the greater the portion of the dataset that was factorized; the percentage of total variance indicates the significance of the factor – the higher the percentage of variance it explains, the more significant it is, and the more variables it includes.

Thus, factor analysis was employed to determine which educational factors are the most significant, for which the analysis of factor eigenvalues was utilized. Eigenvalues represent variances explained by the factors.

Before conducting this analysis, an examination of empirical data was performed using Kaiser-Meyer-Olkin criteria (in this case, the criterion equals 0.652) and Bartlett's test of sphericity (in this case, it equals 0.00), indicating the acceptability of using this method.

Data analysis

In order to investigate the interrelations between the "drivers" of professionalism and the conditions of the internal and external educational environment of higher education institutions (HEIs) more comprehensively, we employed the data from a factor analysis conducted by Hans Heijke et al., (2003).

Based on the results of the analysis, four factors were identified, explaining 73% of the variance. The first factor (explaining 22% of the variance) encompasses a group of factors related to the HEI's educational environment that are associated with students' orientation toward future activities. These factors include aspirations to ensure a professional career, better preparation for future activities, becoming a highly qualified specialist, and considering success in the job placement process.

The second factor (also explaining 22% of the variance) consists of factors associated with the external aspects of the HEI's educational environment, such as the logic and coercion of family-related factors (parental control, a desire not to stand out in terms of success among peers) and economic factors (tuition fees). This factor is linked to the development of future professionals' ability for effective social communication.

The third factor, explaining 14% of the variance, combines motives related to quality control of education and coercion in the form of an orientation towards the accumulation of success "capital." This includes considerations during the allocation of scholarships and job placement.

The least significant among the mentioned factors (approximately 14% of the variance) is the one that integrates factors most homogeneous to the HEI's educational environment, namely, interest in academic disciplines and the demands of instructors. This factor specifically determines the observed convergence of aspirations regarding the incorporation of cultural capital, along with its subsequent institutionalization.

Results and discussion

The research results indicate that the orientation toward future professional activity is not determined by any ascriptive status of higher education students (such as gender, place of residence before entering higher education, parental education, or family financial status).

Among students whose motivation is characterized by the first factor, clear professional status aspirations are discernible, as they are more likely to plan engagement in practical activities related to their specialization after completing their education (correlation coefficient is significant, with a strength of association $\rho=0.275$). Alternatively, they may pursue research activities (significant correlation, with a strength of association $\rho=0.199$) or teaching positions (significant correlation, with a strength of association $\rho=0.187$). Such students invest a considerable amount of time in preparing for daily classes (significant correlation, with a strength of association $\rho=0.201$) and examinations (significant correlation, with a strength of association $\rho=0.217$). They demonstrate high academic performance (significant correlation, with a strength of association $\rho=0.339$).

Students motivated by external control within the educational environment, based on the research findings, tend to come from families with a higher income level (significant correlation, with a strength of association $\rho=0.101$). The objective cultural capital of their families, represented by a home library, is lower than that of their peers (significant correlation, with a strength of association $\rho=-0.153$). After completing their education, these students are more inclined to seek high administrative and managerial positions compared to their colleagues. However, it is worth noting that their relatively high level of professional-status aspirations is not reflected in intensive academic practices, a desire to acquire foreign language proficiency or the outcomes of their academic performance.

Higher education students motivated by the desire to achieve high academic success are often from families with limited financial resources (significant correlation, with a strength of association $\rho=0.141$) and reside in smaller towns or rural areas (significant correlation, with a strength of association $\rho=0.155$). These individuals strive to allocate more time for study preparation compared to students whose motivation is primarily driven by external non-academic factors. The authors of the research emphasize that quantitatively, these practices result in relatively high grades. However, their academic performance is comparatively lower than that of students oriented towards successful professional activities.

According to the research findings, motivation characterized by an interest in academic disciplines and the demands of instructors influences the inclination towards pedagogical activities and contributes to achieving reasonably high academic success. The research results are presented in Table 3.

Table 3.
Factor Loadings of Higher Education Students' Professional Motivation

	Factors			
	1	2	3	4
Desire to secure a professional career	0,866	0,140	-0,035	0,040
Desire to better prepare for professional activity and become highly qualified	0,863	-0,042	-0,101	0,150
Parental control	0,088	0,817	0,115	-0,086
Desire not to stand out among peers due to success	0,071	0,805	-0,026	0,092
Tuition fee	0,093	0,701	-0,472	-0,046
Consideration of grades in scholarship allocation	-0,004	-0,072	0,894	0,102
Instructor's demands	-0,062	0,213	0,208	0,809
Interest in academic disciplines	0,263	-0,263	-0,086	0,725

Therefore, through the means of factor analysis, it has been established that the determining factors influencing the impact of the educational environment on the formation of future professionals are orientation towards future specialized activity and external control over academic performance by non-institutional entities. Unfortunately, the second factor reduces the academic success of higher education students, leading to the formation of their perception of the educational process as a compulsory activity and the educational environment as an alien space in which subjectivity is lost.

Conclusions

The study delves into the multifaceted nature of the educational environment, emphasizing its role as a social space where educational and professional activities take place, fostering formal and interpersonal interactions between learners and educators. This environment serves not merely as a set of conditions but also as a means to achieve educational objectives.

Employing factor analysis, the study identifies the most influential factors shaping professional and social competencies within the educational environment. Quantitative indicators, specifically variance, rank the significance of these factors as follows: 1) students' orientation towards future activities (22% of variance); 2) external aspects of higher education institutions' educational environments (22% of variance); 3) material interest factors (14% of variance); and 4) factors closely aligned with the educational environment of higher education institutions (14% of variance).

The research emphasizes the simultaneous cultivation of both hard and soft skills among future professionals within modern higher education institutions. It advocates against compartmentalizing Hard Skills and Soft Skills, asserting that professionals must possess not only technical proficiency but also strong communication abilities, negotiation skills, and writing proficiency. These foundational skills should be nurtured within the educational environment of higher education institutions.

Furthermore, the study underscores the importance of creating enriching learning environments conducive to holistic skill development. Educators are encouraged to go beyond traditional knowledge dissemination methods, emphasizing active engagement, critical thinking, and problem-solving. Practical experiences, such as internships and real-world projects, are recommended to help students acquire the necessary technical competencies and interpersonal skills demanded by employers.

Continuous assessment and evaluation of educational programs are deemed essential to ensure their efficacy in preparing students for the contemporary workforce. Employers are urged to recognize the value of candidates with well-rounded skill sets, comprising both technical proficiencies and soft skills such as communication and adaptability.

However, the study acknowledges the need for further research to tailor findings to specific specialties within the realm of future professionals, given the diverse range of disciplines involved.

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Cloud and education: transforming teacher training

Хмара та освіта: трансформація підготовки вчителів

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Abstract

The article clarifies mandatory approaches, forms, and resources of learning in a cloud-oriented environment; the possibilities of realizing the advantages of the latest technologies in research institutions are revealed; highlighted the peculiarities of the introduction of cloud technologies in the countries of the European Union and the USA. In the process of research, the ways of ensuring the integration of all components of cloud technologies have been identified. With the aim of changes and innovations of all their components, the main integration functions, factors, and principles of cloud technologies are shown in the preparation and retraining of future teachers-practitioners. This work allowed us to conduct a study that contributed to the development, substantiation, and experimental verification of ways of using a cloud-oriented educational setting for the creation of the qualified position of a teacher. As a result of the experimental work, we observe an increase in the level of IC-competence of

Анотація

У статті з’ясовано обов’язкові методи, форми та засоби навчання у хмаро орієнтованому середовищі; розкрито можливості реалізації переваг новітніх технологій в науково-дослідних установах; вивчено особливості впровадження хмарних технологій у країнах Європейського Союзу та США. У процесі дослідження виокремлено шляхи забезпечення інтеграції всіх компонентів хмарних технологій. З метою змін і інновацій всіх їх складових показано основні інтеграційні функції, чинники й принципи хмарних технологій при підготовці та перепідготовці майбутніх педагогів-практиків у хмаро орієнтованому освітньо-науковому середовищі. Така пророблена робота дозволила нам провести дослідження, яке сприяло розробці, обґрунтуванню та експериментальній перевірці шляхів використання хмаро орієнтованого освітньо-наукового середовища для формування професійної позиції педагога. У результаті проведення експериментальної

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teachers, which is possible in a cloud-oriented educational and is a necessary condition for the formation of the professional position of a teacher.

Keywords: cloud-oriented educational and scientific environment, professional position of a teacher, cloud technologies, training and retraining of future teachers, professional development.

роботи спостерігаємо підвищення рівня ІК компетентності педагогів, що можливо у хмаро орієнтованому освітньо-науковому середовищі та є необхідною умовою для формування професійної позиції педагога.

Ключові слова: хмаро орієнтоване освітньо-науковове середовище, професійна позиція педагога, хмарні технології, підготовка та перепідготовка майбутніх педагогів, підвищення кваліфікації фахівців.

Introduction

In modern society, it is necessary to introduce information technologies into educational practice and update the ways of their application in conditions of rapid development. The future teacher must be ready to create new things, be able to quickly adapt to innovations, rely on the acquired skills, abilities, and knowledge, and be able to creatively apply them during the implementation of professional tasks that arise in the process of educating students and their training. With this approach to education, there is an increased emphasis on the problem of improving the process of forming a teacher's professional position, that is, the readiness of future teachers for modern professional activities (Khmil, 2017).

It is cloud technologies that most satisfy the needs of solving important and necessary educational, cultural, and social problems of the modern information society. The most significant of them are the improvement of the level of quality and accessibility of teaching, the interconnection of the processes of training methodical and educational workers and scientific research, ensuring and shaping the functioning of the educational environment of educational institutions, and improving their design. These technologies are promising and become a tool for the implementation of equal access to education, and the principles of human-centeredness in pedagogical systems of higher education (Nosenko et al., 2016).

The relevance of the process of forming the professional position of a teacher using cloud technologies is due to the need to increase the effectiveness and efficiency of the introduction of information and communication technologies, cloud computing, which are recognized in the modern European educational space as leading ICT tools, into the educational process of higher education institutions, to improve the level of personnel training, and to improve the indicators of their use cloud technologies.

The article focuses on the following main aspects:

– mandatory methods, forms, and means of learning in a cloud-oriented environment; possibilities of realizing the advantages of the latest technologies in research institutions;
– support for the implementation of cloud technologies by the state policy of the countries of the European Union regarding the improvement of the qualifications of teachers and their quality training;
– peculiarities of training and retraining of future practicing teachers in the USA regarding the possibility of using cloud technologies in the educational space for the possibility of creating a cloud-oriented educational and scientific environment to form the professional position of the teacher;
– ensuring the integration of all components of cloud technologies, with the aim of changes and innovations of all their components;
– integrative functions of cloud technologies in the preparation and retraining of future pedagogues-practitioners in a cloud-oriented educational and scientific environment;
– the factors of the formation of a cloud-oriented environment and the principles of the formation of a cloud-oriented educational and scientific environment contribute to the formation of the professional position of the teacher;
– experimental verification of the effectiveness of the ways of using a cloud-oriented educational and scientific environment for the formation of the teacher's professional position;
– recommendations for the use of cloud services in the formation of the teacher's professional position;
– important cloud services should be used in a cloud-oriented educational and scientific environment for the formation of the professional position of a teacher.

Literature review

Based on the preliminary analysis of psychological and pedagogical literature, we conclude that the educational process in higher education in modern society should be built taking into account the individual capabilities and characteristics of higher education students, their interests, abilities, and needs while creating optimal conditions for the formation of their professional position. formation, development, and realization of natural potentials. A special place in our research is devoted to the formation of the teacher's professional position, his methodological tactics and strategy, and the formation of professional readiness for the use of cloud technologies by future teachers in the educational process. Thus, N. Khmil (2017) proved the importance and necessity of a personally oriented approach in forming the professional position of a teacher and the readiness of future specialists to use cloud technologies in the educational process. The author systematized the signs of a personally oriented approach and provided an interpretation of the main researched concepts. The author's approach to ways of implementing a personally oriented approach during student training using cloud technologies is proposed. The need to take into account the features of a personally oriented approach to ensure the conditions for the development of future teachers' abilities for self-improvement, self-education, self-realization of self-development concerning the mastery of cloud technologies by students of education and the methods of their application in educational institutions is proven.

For teachers, scientific-pedagogical and scientific workers, and students of educational institutions Yu. Nosenko, M. Popel, & M. Shyshkina (2016) to form a cloud-oriented didactic and methodical setting of an educational and pedagogical institution offered recommendations which the authors on the basics of using cloud services of the educational and scientific environment theoretical information covering the criteria for the selection of resources and means, the conceptual apparatus, modeling of the environment structure is provided. The methodological foundations of the formation of research and pedagogical skills are shown in the examples of using Office 365 and Google services: text editor, electronic calendar, e-mail, electronic notebook, e-book, file storage, etc. The possibilities of using SageMathCloud are described: the creation of educational resources such as course, sage-chat, sagews; the project and its components; with the help of standard control elements, the technology of developing interactive models is considered.

Scientists P. Quezada-Sarmiento, C. Suárez-Guerrero, M. Narvaez-Rios & L. Gutiérrez-Albán (2022) in their article propose a pedagogical methodology that allows the use of cloud computing tools as complementary material in the development of computational and military skills: navigation, understanding and reading of charts. The authors present and reflect on how to incorporate the map into educational processes, strengthening positioning skills and competencies in orientation exercises. This article is part of the research project Design of a Pedagogical Model based on Cloud Computing and Affective Computing for the development of computational skills at Valencia University. In conclusion, the use of Cloud Computing tools allowed generating an environment of greater interactivity between teachers and the soldiers in training likewise, it allowed to generate an adequate educational process.

The problem of optimization and Scalability of Educational Platforms: Integration of Artificial Intelligence and Cloud Computing is highlighted in their research by J. Govea, E. Ocampo Edye, S. Revelo-Tapia & W. Villegas-Ch (2023). They emphasize that the intersection between technology and education has taken on unprecedented relevance, driven by the promise of transforming teaching and learning through advanced digital tools. This study proposes a comprehensive exploration of how cloud computing and artificial intelligence converge to impact education, focusing on accessibility, efficiency, and quality of learning.

L. Machado, F. Rita & C. Santos (2017) emphasize a brief survey about cloud and mobile integrated technologies and their possible contributions to support centralized data management in educational systems, relating improvements in governance, data security, mobility, economic viability, and environmental impact. Therefore, this work also presents a list of already free and private technologies and their advantages and disadvantages in the Brazilian scenario. In this sense, the herein technological aspects consider the integration between cloud and mobile technologies as an essential alternative to suppress online requirements, which is a limitation for a large number of public institutions that have problems being effectively connected to the Internet.

The practice of using cloud facilities of teachers of Ukraine in the organization of general secondary education is interesting, disclosed, and grouped by S. Lytvynova (2016). The author presents the results of the use of cloud services in management activities and the educational process by teachers of educational institutions in Ukraine under the implementation of the All-Ukrainian project "Cloud Services in Education". The main forms, directions, and methods of using Office 365 cloud services are disclosed: Outlook Online e-mail, Sway, OneNote Classroom, electronic calendar, Skype (Lync) Online, Word Online text editor, OneNote electronic notebook, Excel Online e-book, Yammer network, presentation editor PowerPoint Online, personalized learning environment OneNote Class. The material is valuable for teachers of higher education institutions, teachers of educational institutions, students of higher education institutions, and scientists.

L. Sikoraka (2019) showed the ways of using cloud technology of higher education institutions, which makes it possible to quickly update informational material, is economically and strategically beneficial, and provides a flexible way of satisfying the education of those seeking education. Using concrete examples, the scientist shows the ways of using cloud technologies at various stages of the lesson "Fundamentals of Industry Economy and Entrepreneurship".

In the works of M. Zhaldak, & Yu. Tryus (2005) and T. Kobylnyk (2009) show that one of the main components of the fundamentalization of IT training of higher education students, the formation of the professional position of a teacher using cloud technologies is the teaching of mathematical informatics, which, founded on the practice of technologies and information systems for solving applied problems, is a component of theoretical informatics, where tools and mathematical models are used to study information processes and modeling in various spheres of human activity.

Despite the existence of existing scientific works on the issue of the formation of professional readiness of future teachers for the use of cloud technologies in the educational process and the significance of this problem for higher pedagogical education, it remains underdeveloped. Aspects such as systematic presentation of theoretical-methodological and methodical aspects require more thorough research on the principles of professional training of future teachers for the use of cloud technologies in the educational process, clarifying the principles and regularities of this process; substantiating the conditions, content, methods, forms and means of training future teachers for the use of cloud technologies in the educational process.

The analysis of theory and practice on the researched problem revealed several contradictions between the need for teachers who can innovatively organize the educational process using cloud technologies for the comprehensive development of students, and the lack of a system for forming the professional readiness of future teachers for this area of professional activity; potential opportunities of cloud technologies as an innovative tool in the field of education and the insufficient level of their use in educational activities; multifaceted pedagogical possibilities of cloud technologies and their fragmentary presentation in the content of professional training of future teachers; constant improvement of cloud services and insufficient readiness of future teachers to independently master theirs opportunities for further effective application in the educational process.

Methodology

The purpose of the article: is to develop, substantiate, and experimentally verify the ways of using a cloud-oriented educational environment for the formation of the teacher's professional position.

The object of the study is the process of creating a cloud-oriented learning environment for an educational institution.

The subject of the study: the formation of the professional position of the teacher using cloud technologies.

The task of the research: to outline the main characteristics of the cloud-oriented educational environment of the educational institution; construct the activities of higher education students and teachers, show ways of organizing their interaction during the educational process, optional classes, extracurricular activities, etc.; analyze the use of electronic instructive properties in a cloud-oriented educational environment; to develop methodological guidelines for the development of the educator's qualified position using cloud technologies, the use of a cloud-oriented educational environment.

To achieve the goal and solve the tasks, the following methods of scientific knowledge were used:

- *theoretical methods*, to study and analyze normative sources, psychological, philosophical, methodical, and pedagogical literature; comparative analysis of the scientific work of foreign scientists and domestic scientists on the problem of forming the professional position of a teacher using cloud technologies to outline the semantic load of the studied phenomenon and its conceptual boundaries; logical-systemic analysis, which includes: analogy, classification, deduction, induction, and generalization of practical and theoretical data to determine ways of forming the professional position of a teacher using cloud technologies;
- *empirical methods* – observations, and questionnaires to find out and check the effectiveness of implementing ways of forming the teacher's professional position using cloud technologies; comparison of obtained experimental data to clarify dependencies and causal relationships.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size is 40 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The training and retraining of higher school teachers for the use of cloud services in a cloud-oriented educational and scientific environment for the formation of the teacher's professional position was carried out in three stages.

In the first stage, we offered the training "Designing a cloud-oriented educational environment".

In the second stage, respondents were offered a course on intensive use of services as part of summer training.

In the third stage, during the seminar, the respondents presented their best practical solutions regarding the use of cloud services for educational purposes for the formation of the teacher's professional position.

Table 1.
The level of IR competence of future specialists

The level of IR competence of future specialists	%
Teachers' understanding of the importance and necessity of forming the professional position of future cloud service specialists in a cloud-oriented educational and scientific environment	43%
The use of cloud services by teachers in their professional activities	48%
The basic knowledge of future specialists about the possibilities of cloud services	47%
The possibility of cooperation using cloud services in a cloud-oriented educational and scientific environment	45%
With the help of cloud services, the use of various forms of educational activities for the formation of the teacher's professional position	47%
For the formation of the professional position of the teacher in the training of higher education seekers, the use of basic services	48%

So, the training of teachers in new information and communication technologies, in particular cloud services during the formation of the professional position of a teacher in a cloud-oriented educational and scientific environment, made it possible to determine that: specialists are actively improving their knowledge. qualifications in the field of ICT; no problems with missing devices; systematic training in three stages gives significant results in the development of the intellectual competence of the individual during the formation of the professional position of the teacher; cloud services become an effective tool in the cloud-oriented educational and scientific environment of a higher school during the organization of cooperation and joint work of teachers and students of education.

The reliability and validity of the obtained results, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

Results and discussion

Today, new information technologies are emerging, which, being integrated into the educational process, change the traditional ones and contribute to the emergence of new methods, forms, and means of learning. Among such technologies, cloud technologies are now preferred as they play an important role in the creation of modern informational educational environments, the implementation of e-learning; contribute to the organization of joint and continuous access to educational information resources; ensure the organization of joint network interaction of participants in the educational process. Given this accelerated the process of their active introduction into education requires the teacher of professional knowledge and skills to consciously apply the pedagogical potential of these technologies for improving the quality of the educational process, as well as the comprehensive development of the young generation. Solving the problem requires the development of a strategy for professional training of future teachers for the use of cloud technologies in the educational process.

In connection with the above, in this section we have defined the following issues: ensuring the integration of all components of cloud technologies, with the aim of changes and innovations of all their components; integrative functions of cloud technologies in the training and retraining of future pedagogues-practitioners in a cloud-oriented educational and scientific environment; the factors of cloud-oriented environment formation and the principles of cloud-oriented educational and scientific environment formation contribute to the formation of the teacher's professional position. We also experimentally verified the effectiveness of ways to use a cloud-based educational and scientific environment for the formation of a teacher's professional position; recommendations are made regarding the use of cloud services in the formation of the teacher's professional position.

A democratic open system – the Internet is currently the most prominent means of information skills. The Internet covers millions of users. The following achievements of the scientific and technical revolution can be used for educational purposes: for any branch of science, the operational reproduction and transfer of information; operation and preservation of data obtained by students during research and educational activities; according to the level of knowledge formation, control is mandatory (Kaynak et al., 2023).

Students are obliged to prepare abstracts, scientific projects, theses of reports, essays, etc., which involve actively searching for the necessary information on the Internet. Without the teacher's guidance, the learner resorts to spontaneous and chaotic use of Internet resources. However, the help of the teacher in performing research and scientific tasks with the help of the Internet is only a small part of the possibilities of the Internet. Only cloud technologies allow you to use the full capabilities of Internet resources.

Scientists, in a broad sense, consider cloud technologies (English cloud technologies) to be a model of data processing that provides convenient, affordable, ubiquitous network access to servers, general storage of resources, applications and services, etc. So, cloud technologies are understood as a set of tools that provide processing, transfer, and storage of data on servers of the worldwide network from personal devices (Danysko & Kornosenko, 2019).

To implement cloud services in a higher education institution, it is necessary to introduce appropriate elements of education, conduct appropriate training, first of all, introduce innovative approaches to the content of training, upgrade the qualifications of personnel, and retrain specialists. The content of training to form the professional position of a teacher should be aimed at forming the ICT competence of teachers, employees of ICT sectors, students, and graduate students regarding the high-quality and free use of services in the didactic process and scientific research.

Mandatory methods, forms, and means of learning in a cloud-oriented environment.

Learning methods used in a cloud-oriented environment are:

– practical (practical and laboratory work, solving problems, exercises, etc.);
– verbal (explanations, lectures, conversations);
– research (heuristic, problem-search, partial-search).

Forms of education are educational (special) courses, individual consultations, trainings, webinars, seminars, web conferences, etc. Among the innovative forms of training that are implemented only in a cloud-oriented environment is the use of combined training, which combines remote and face-to-face forms of work. During the training, an electronic situational learning network is created, where the participants are directed to implement high-quality collective activities according to a common scenario. The organizer of the training shows examples of high-quality successful activities. This can be preliminary material in the templates of educational tasks, interactive use of means of audio and visual presentation of the procedure of performing tasks, monitoring worksheets; and association of ICT-mediated management of the educational process. Due to the involvement of individual expert participants in the training, the technology of increasing the activity of the activity takes place.

Automated incomes and facilities of cloud technologies appear as means of learning in a cloud-oriented environment (Microsoft Office 365: World, PowerPoint, Site, Blog, Excel, Excel-Forms, One Drive, One Note, Skype).

The result of training is: increasing the level of participants in the ICT educational process of competence, creating a cloud-oriented atmosphere for the formation of the professional position of a teacher, and improving the organization and results of scientific and pedagogical research, which become more accurate and concrete.

Possibilities of realizing the advantages of the latest technologies in research institutions.

To modernize and improve scientific-organizational and scientific activities in scientific research institutions, the implementation of modern technologies is necessary. The formation of the information society is largely determined and inextricably linked to the development and spread of innovative technologies: information and communication networks, web and cloud services, virtual reality technologies, mobile, adaptive technologies and tools, etc. The introduction of such technologies pays to the perfection of the efficiency of professional and informative activities, qualitative updating of data processing processes, and their interaction (Plakhotnik et al., 2023).

We consider the Google service (Google Apps) to be one of the most promising tools and the most accessible in this context. Google Apps is an important balanced package of cloud services, which is necessary for information technology support of interoperable work offered by Google Inc. Use can be on a paid basis, by subscription, or free of charge. Google Apps is a cloud solution, so all user data is not stored on the client's local servers, but distributed in secure and reliable data centers.

The use of Google Cloud services, with this approach, provides support for the scientific and organizational activities of a scientific research institution and scientific work and contributes to the implementation of scientific and pedagogical research, increasing the level of organization of scientific work, contributes to the implementation of the results of the work carried out, and also ensures an increase in the general level of IC-competence of sub-objects of the scientific research institution (heads of laboratories, departments, scientific correspondents, graduate students, scientific employees, doctoral students, interns, etc.) (Nosenko et al., 2016).

Support for the implementation of cloud technologies by the state policy of the countries of the European Union regarding the improvement of the qualifications of teachers and their quality training.

The countries of the European Union in the 21st century in their educational policy give an important place to the subject of the active mandatory use of cloud technologies in the system of higher education and the system of teacher training. The primary role in this process was given to the European Commission strategy "Unleashing the Potential of Cloud Computing in Europe" (Bosse et al., 2016). The active use of cloud technologies in the educational and scientific space encourages educational institutions to create a cloud-oriented educational and scientific environment, develop and approve normative documents regarding the creation of the expert position of educator, determine the priority ways of improving the teacher's qualifications and training specialists in pedagogical activity in this direction (Semenikhina et al., 2020).

In each country, the implementation of cloud technologies in the educational process is at different stages, the creation of a cloud-oriented educational and scientific environment for the formation of the professional position of a teacher is always in the first place in the normative basis of the countries of the European Union, we note that in the state policy, the preparation and improvement of the teacher's qualifications in this direction, development of priority ways and improvement of the educational field is determined by them independently (Zhang, 2023).

Such specified features of training and retraining of future teachers-practitioners in the countries of the European Union will provide an opportunity to apply cloud technologies in the domestic educational space and to concentrate the best assets of foreign countries to create a cloud-oriented educational and scientific environment to form the professional position of a teacher (Khmil, 2020).

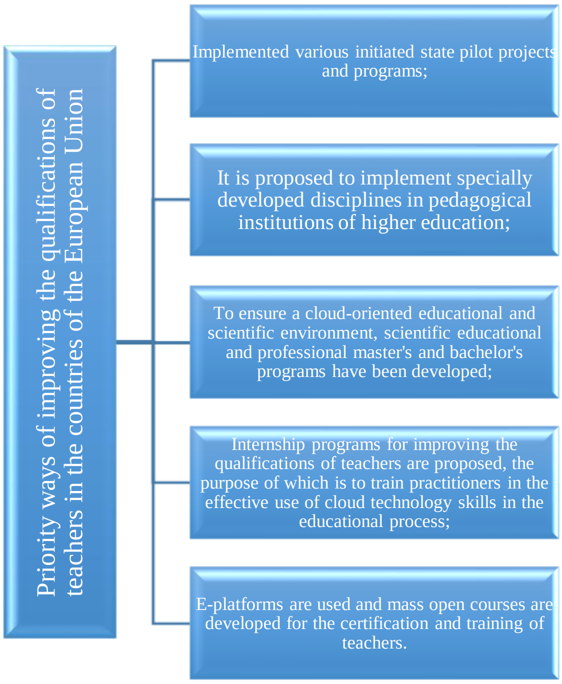

Figure 1. Priority ways of improving the qualifications of teachers in the countries of the European Union.

Peculiarities of training and retraining of future practicing teachers in the USA regarding the possibility of using cloud technologies in the educational space for the possibility of creating a cloud-oriented educational and scientific environment to form the professional position of the teacher.

Specialists of the US National Institute of Standards and Technology (NIST) consider cloud technologies (Cloud Computing) as a model of "convenient network access to the general fund of information resources, including data files, servers, networks, services, and software that can be quickly provided by conditions of minimal management effort or interaction with the supplier" (Mell & Grance, 2011).

Specialists of the US National Institute of Standards and Technologies (NIST) singled out the general properties of cloud services: homogeneity of the infrastructure; advanced security technologies; mass application; stability of calculations; application virtualization; geographically distributed use; cheap software; service orientation (Nosenko & Voloshinska, 2016). Among the characteristics, the following are noted: free network access, self-service capabilities, fast elasticity (release of the resource at any time in the required amount), independence from the location of the resource, service measurability (payment is made upon the fact of providing services) (Shyshkina, 2015).

Specialists of the US National Institute of Standards and Technologies (NIST) singled out the most important categories related to the application of cloud technologies in the educational space for the possibility of creating a cloud-oriented educational and scientific environment to form the professional position of a teacher:

1. Software as a Service (SaaS) – delivers data via the Internet, remote management of the educational process, refers to any software;
2. Infrastructure as a service (IaaS), which is a model of providing resources on demand;

3. Platform as a service (PaaS), represents a set of application infrastructure services that are rented from the provider.

So, we can say that cloud technologies include a wide range of different services for the possibility of creating a cloud-oriented environment and widely used applications:

- for data storage (Box, Dropbox, iCloud, etc.) online solutions;
- mail services (such as Office mail Server, Gmail, or Yahoo!);
- other types of applications that may be available online (Crucial Cloud Hosting, 2014).

Ensuring the integration of all components of cloud technologies, with the aim of changes and innovations of all their components.

Cloud technologies in the narrow sense are defined as data processing technologies in which, as an online service, computer resources are provided to the user and involve the implementation of a set of techniques and operations that are carried out in a certain sequence in a certain way and are aimed at creating a cloud-oriented educational and scientific environment, effective and clear organization of pedagogical activity to form the professional position of the teacher and achieve the set goal.

Since the concept of "cloud technologies" fully corresponds to the concept of "educational technology", let's consider cloud technology, summarizing the above definitions, as a system of actions that are consistently performed by the subjects of the educational process, which are gradually implemented and allow to form a cloud-oriented educational and scientific environment with the aim formation of the teacher's professional position (Sayginer, 2023).

The construction of cloud technologies for a cloud-oriented didactic and methodical environment is built on the next provisions:

- the application of a personal approach in the formation of the professional position of a teacher, which provides opportunities for the use of interactive methods of education;
- following the model of competence of the teacher-practitioner, the development of educational programs for the formation of the professional position of a specialist using cloud technologies;
- flexibility of methods, content, and implementation of advanced technologies;
- reasonableness and interdependence of integration and differentiation of innovative elements, which is the basis of cloud technologies;
- the unity of target attitudes in the formation of the teacher's professional position, which ensures the process of implementation of cloud technology and involves all subjects of the educational process;
- systematic and continuous formation of the professional position of the teacher and at all stages of the professional formation of students and training themes of the didactic process, functioning of the technological process.

Therefore, when implementing and developing cloud technologies to form the professional position of a teacher, it is necessary to ensure the integration of all its components, taking into account the synergistic vision that changes in one of the components will lead to significant changes in other components.

Integrative functions of cloud technologies in the preparation and retraining of future pedagogues-practitioners in a cloud-oriented educational and scientific environment.

The following integration functions are important for the implementation of the possibility of using cloud technologies in the educational space in a cloud-oriented educational and scientific environment:

- the information function is the basis for creating an information base, which, in turn, is the basis for planning in the field of education to form the professional position of a teacher;
- the cognitive function ensures the formation of cognitive processes (thinking, attention, memory, imagination) in a cloud-oriented educational and scientific environment, and therefore promotes understanding, reflection, reproduction, and assimilation of educational material by teachers;
- the organizational and management function is manifested in the creation of a cloud-oriented educational and scientific environment, which is the result of planning the optimal, most favorable conditions for management and rational organization of the learning process;
- the control function involves systematic monitoring in a cloud-oriented educational and scientific environment, contributes to

the valuation of the superiority of ensuring instructive achievements and forming the teacher's professional position on this basis, and provides rational pedagogical influences to correct or stimulate knowledge.

Therefore, the use of cloud technologies in a cloud-oriented educational and scientific environment in the training of specialists in a higher education institution and the retraining of personnel allows to increase in the administrative, cognitive, informational, and control components of the training process (Danysko & Kornosenko, 2019).

The factors of the formation of a cloud-oriented environment and the principles of the formation of a cloud-oriented educational and scientific environment contribute to the formation of the professional position of the teacher.

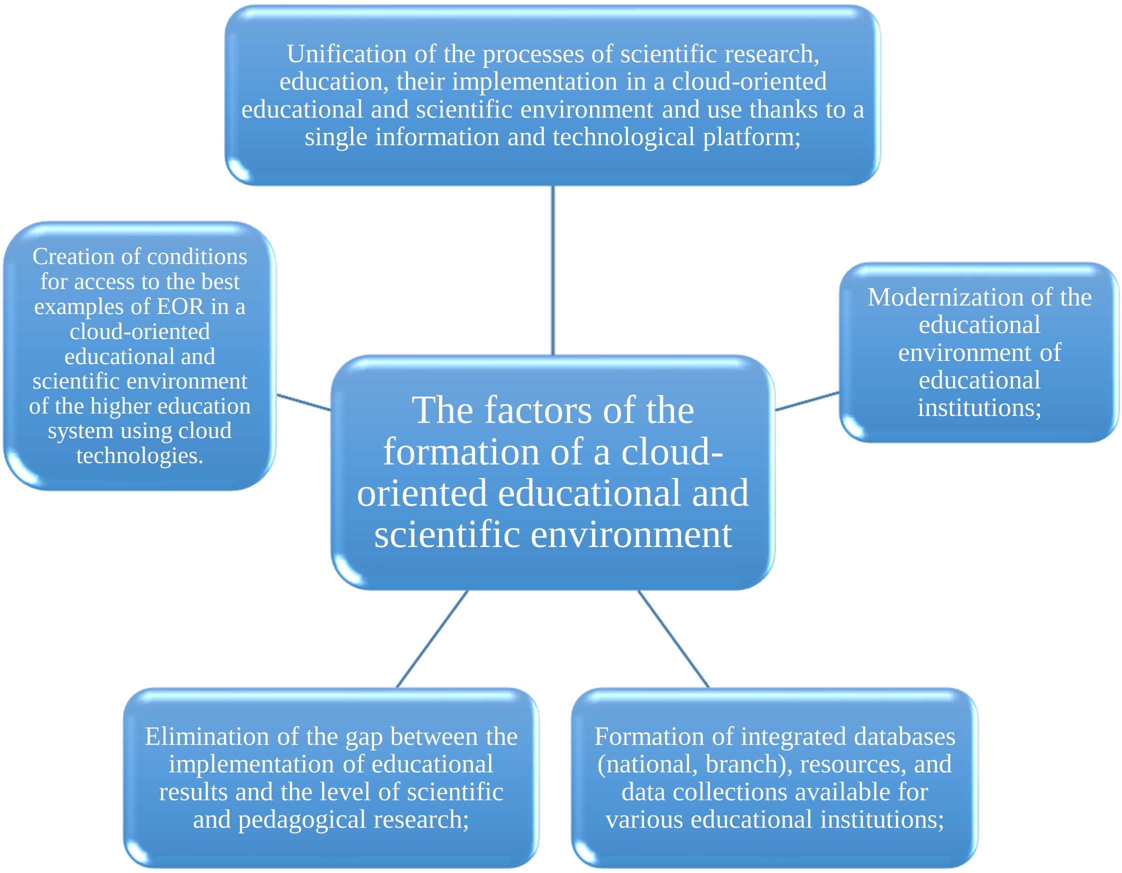

Figure 2. The factors of the formation of a cloud-oriented educational and scientific environment.

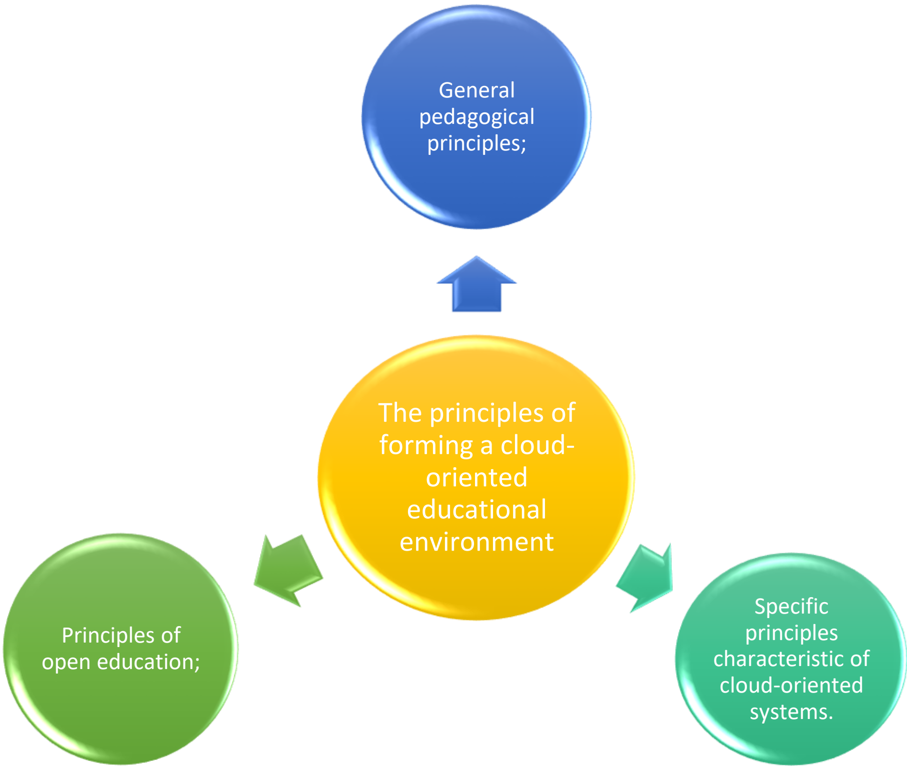

Figure 3. The principles of forming a cloud-oriented educational environment (Nosenko et al., 2016).

Experimental verification of the effectiveness of the ways of using a cloud-oriented educational and scientific environment for the formation of the teacher's professional position.

Having clarified the mandatory methods, procedures, and incomes of learning in a cloud-oriented environment; revealing the possibilities of realizing the advantages of the latest technologies in research institutions; having studied the peculiarities of the introduction of cloud technologies by the state policy of the countries of the European Union and the USA regarding the possibility of using cloud technologies in the educational space to form the professional position of the teacher; having singled out the ways of ensuring the integration of all components of cloud technologies, with the aim of changes and innovations of all their components, we found out the main integration functions, factors, and principles of cloud technologies in the preparation and retraining of future teachers-practitioners. This work allowed us to conduct a study that contributed to the development, substantiation, and experimental verification of ways of using a cloud-oriented educational environment of the qualified position of a teacher.

The training and retraining of higher school teachers for the use of cloud services in a cloud-oriented educational and scientific environment of the teacher's qualified position was carried out in three stages.

In the first stage, we offered the training "Designing a cloud-oriented educational environment" for which 8 hours were allocated. The task of every administrator of a higher education institution was to create a cloud-oriented environment of an educational institution, and the teacher had to create his own educational environment. When conducting the training, we set the goal: of improving the skills of working with certain services in a cloud-oriented educational and scientific environment for the formation of the professional position of a teacher and solving problematic issues that arose in the practical activity of a specialist during the use of services.

In the second stage, respondents were offered a course on intensive use of services as part of summer training, with a volume of 40 hours (during the summer vacation). The result of this stage was the development of a group project where teachers received unlimited communication with colleagues, had the opportunity not only to combine the development of IC-competencies but also to get acquainted with the latest innovations in the IT industry, to organize joint work on projects, to improve pedagogical skills while using services for the formation professional position. Free access to the Internet and the availability of a gadget (tablet, laptop, etc.).

In the third stage, during the seminar, the respondents presented their best practical solutions for using cloud services for educational purposes to form the professional position of a teacher.

Students in classes preferred the following cloud technologies and cloud platforms.

Cloud technologies:

1) use of Office Web Apps;
2) electronic journals and diaries;
3) online services for the educational process, communication, and testing;
4) distance learning systems, library, media library;
5) file storage, sharing;
6) joint work;
7) video conferences;
8) e-mail with the gymnasium domain.

Cloud platforms.

The Google Apps Education Edition cloud platform provides the following services: Google Calendar, Gmail email, Google Drive, Google Sites, Google Drive, and Google Docs.

Google Drive is a repository for storing your own files and the ability to configure access rights to them.

Google Docs is a service for creating documents, tables, and presentations with the possibility of granting shared access rights to several users.

Convenience and versatility of access are ensured by the wide availability of services.

In the "cloud" you can create folders and documents, use a text editor (Word), a spreadsheet (Excel), a presentation editor (PowerPoint), and a survey editor (forms).

To master new services, a teacher needs constant professional development in ICT issues in connection with their constant development and progress.

During the proposed educational seminar in a cloud-oriented educational and scientific environment, future specialists had the opportunity to learn about the practical application of cloud services and their theoretical foundations. They were offered practical work using several services to improve the educational process to form a professional position or organize cooperation education seekers.

As a result of the experiment, we observe an increase in the level of IC competence of future specialists, which is possible in a cloud-oriented educational and scientific environment and is a necessary condition for the formation of the professional position of a teacher.

In particular:

– teachers' understanding of the importance and necessity for the formation of the professional position of future cloud service specialists in a cloud-oriented educational and scientific environment increased by 43%;
– the practice of cloud facilities by teachers in their expert doings increased by 48%;
– the basic knowledge about the possibilities of cloud services increased by 47%;
– the ability to collaborate with the help of cloud services in a cloud-oriented educational and scientific environment increased by 45%;
– with the support of cloud facilities, the use of various forms of educational activity to form the professional position of a teacher increased by 47%;
– for the formation of the professional position of the teacher in the training of students of higher education, the use of basic services increased by 48%.

Therefore, the training of teachers in new information technologies, during the formation of the professional position of a teacher in a cloud-oriented educational and scientific environment, made it possible to determine that: specialists are actively improving their qualifications in the field of ICT; there are no problems with missing devices; systematic training in three stages gives significant results in the development of an individual's intellectual competence during the formation of the professional position of a teacher; cloud services become an effective tool of a higher school during the organization of cooperation and joint work between teachers and students of education.

The average and sufficient level of IC-competence of future specialists during the formation of the professional position of a teacher allows for the wide use of cloud services for various types of activities, namely in the organization of "inverted learning", the organization in a cloud-oriented educational and scientific environment of group work of education seekers, joint work on projects; conducting web quests. Therefore, cloud services in a cloud-oriented educational environment become a tool for a modern teacher for the formation of his professional position (Lytvynova, 2016).

Recommendations for the practice of cloud services in the formation of the teacher's qualified position.

We recommend several directions of application of cloud services in shaping the professional position of future experts in the context of their training and retraining, which combines electronic and traditional components with the help of the G Suite for Education cloud educational platform.

1. Instrumental equipment for the creation of the qualified position of an educator for the creation of electronic educational materials in a cloud-oriented educational position (a disk for storing information, documents, tables, presentations, photo and audio banks, video editors, geoservices, virtual trips, etc. – Google Drive, Google Docs, Google Sheets, Google Slides, Google Photos, YouTube, Google Maps, Google Expeditions, etc.).
2. Services for placing materials in a cloud-oriented educational and scientific setting and accounting for the activities of students of education (sites, e-mail, blogs, network diaries, calendar, virtual room, survey forms – Gmail, Google Blogger, Google Sites, Google Forms, Google Calendar, Google Classroom, etc.).
3. Services for interactive interaction of participants in the educational process (webinars, chats, forums, social networks – Hangouts, Gmail, Google+, etc.).

The Google Classroom cloud cyber room is an important service of the G Suite for Education platform. It easily integrates interactive tools for the formation of the teacher's professional position, to support the teaching and learning of third-party developers (mind maps, interactive exercises, electronic notebooks, virtual boards, etc.), harmoniously integrates Google applications, and basic services. The Google Classroom cloud cyber room provides an opportunity to generate grades according to any assessment standards, monitor the level of participation of students in the discussion of tasks, and appoint new teachers.

Important cloud services should be used in a cloud-oriented educational and scientific environment for the formation of the professional position of a teacher.

Cloud office technologies. A large group is represented by systems for processing and creating presentations, spreadsheets, and word processors, graphic programs.

The following cloud services belong to this group:

– text – Word Online, Google Documents, Zoho, Personal Office (office.heapnote.com), Writer ONLYOFFICE, Ond Note, etc.;
– spreadsheets – Excel Online, Google Sheets, Office (office.heapnote.com), Online Office Apps, ONLYOFFICE Personal, Tools, etc.;
– presentational – Google Presentations, PowerPoint Online, Prezi, PowToon, Knovio, Google Presentations, Piktochart, etc.;
– graphics – Piktochart, Google Images, Cacoo, Vizualize.me, etc. These cloud services allow you to edit and create dynamic and static graphs, drawings, charts, etc.

With their help, it is easy not only to create textbooks, joint documents, study guides, interactive posters, and electronic worksheets, but also to organize educational projects: both individual and group, track, and comment on the changes made, and be able to determine the activity of the student in completing the task.

Cloud video services. The use and development of educational video materials is of particular importance in working in a cloud-oriented instructive environment for the development of the qualified position of a teacher, since the technological base of the educational sphere is constantly updated. Improving the work of a future specialist involves constant updating in a cloud-oriented educational and scientific environment and systematization of information regarding the formation of his professional position. The implementation of these tasks is facilitated by the use and creation of video lectures, and educational videos posted on the

Internet. In practical activities, it is worth using the capabilities of the YouTube cloud service to form the professional position of a teacher who provides services for viewing, placing, and organizing video materials by users on the Internet. The ability to select and save educational videos, and video lectures lets you ensure the use of the principles of accessibility, clarity, the method of demonstration and illustration of professional exercises, technical elements, etc. in a cloud-oriented educational and scientific environment.

Social services. Modern technologies are not only informational in a cloud-oriented educational environment, but also communicative, which involves the formation of a teacher's professional position not just viewing or consumption of certain electronic content, but also the interaction of participants, its creation and updating. Web 2.0 technologies (Wiki, sites, word clouds, blogs, games, interactive boards, crosswords, presentations, mind maps, etc.) are based on the principle of "collective authorship".

Knowledge control services. Popular among students in a cloud-oriented educational and scientific environment is the Learningapps.org service, which was created for interactive exercises of various types and contains more than 14 different templates: puzzles, crosswords, test tasks, time tape, and sorting quizzes of various types. The created tasks and exercises involve group work and individual performance of tasks.

We offer this service for use in a cloud-oriented educational and scientific environment mainly to increase the motivation of future teachers for the learning process, and formative evaluation of the activation of cognitive activity in the formation of the professional position of the teacher.

The use of cloud technologies in the system of higher education of future specialists creates prerequisites for the organization of personalized training, collective teaching, and improvement of interactive forms of training, which affects the improvement of the quality of the educational process (Danysko & Kornosenko, 2019).

Conclusions

Cloud technology is a data processing model that provides convenient, affordable, ubiquitous network access to servers, shared resource storage, applications, and services, etc. The creation of a cloud-oriented educational and scientific environment provides a flexible method to see the educational requests of education seekers and provides an opportunity to quickly update informational material.

We have clarified the compulsory approaches, systems, and resources of education in a cloud-oriented environment; the possibilities of realizing the advantages of the latest technologies in research institutions are revealed; studied the peculiarities of the introduction of cloud technologies in the countries of the European Union and the USA.

In the process of research, we identified ways to ensure the integration of all components of cloud technologies. With the aim of changes and innovations of all their components, we singled out the main integration functions, factors, and principles of cloud technologies in the preparation and retraining of future pedagogues-practitioners in a cloud-oriented educational and scientific environment. This work allowed us to conduct a study that contributed to the development, substantiation, and experimental verification of ways of using a cloud-oriented environment for the formation of the professional position of a teacher.

The disadvantages of using cloud technologies are as follows: a high-quality Internet connection is required to work in the cloud; the dependence of data security in the cloud on the provider providing the service; there is no full control over user data posted on online sites; there is no physical access to the data hosted in the service provider's cloud.

As a result of the experimental work, we observe an increase in the level of IC-competence of teachers, which is possible in a cloud-oriented educational and scientific environment and is a necessary condition for the formation of the professional position of a teacher.

We have offered recommendations when forming the professional position of a teacher. It was concluded that cloud services are important for education and should be used in a cloud-oriented educational and scientific environment for the formation of the teacher's professional position.

Approaches, systems, and resources of learning in a cloud-oriented environment require further study.

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Gender and education as factors for determining the verbal-visual affiliation of individuals

Пол и образование като фактори за определяне на вербално-визуалната принадлежност на индивидите

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Abstract

Gender and education are two of the socio-demographic characteristics that are studied to establish individual differences in personality. The purpose of the present research is to determine the susceptibility of individuals to the VVQ, adapted and modified from Kirby et al., and to show the influence of gender and education in the segmentation of verbalizers, visualizers, and dreamers. In the study, a valid and reliable instrument for measuring susceptibility to VVQ, prepared in advance by the author, was applied. The results of the analysis of variance (ANOVA) have showed a strong susceptibility of respondents to the Verbalizer Scale of women, as well as susceptibility to the Dreamer Scale of men. When considering the influence of education on VVQ, it was found that respondents with a master's degree were highly visual, and respondents with a doctoral degree were highly verbal. On Dreamer Scale, susceptibility was greatest again among respondents with a doctoral degree. The results of the analysis of covariance (ANCOVA) indicated that male advertising consumers with a master's degree were more receptive to the Verbalizer Scale, as were female respondents with a doctoral degree relative to all other target groups. These scientific results can be useful for advertisers, marketers, as well as specialists in cognitive psychology.

Keywords: verbal-visual cognitive styles, advertising segmentation, VVQ.

Резюме

Полът и образованието са две от социо-демографските характеристики, които се изследват за установяване на индивидуалните различия на личността. Целта на настоящото научно изследване е да установи каква е податливостта на индивидите към VVQ, адаптирана и модифицирана по Кърби и колектив, както и да покаже влиянието на пола и образованието при сегментиране на вербализатори, визуализатори и мечтатели. В изследването е приложен валиден и надежден инструмент за измерване на податливостта към VVQ, предварително подготвен от автора. Резултатите от анализа на вариациите (ANOVA) показват силна податливост на респондентите към Verbalizer Scale на жените, както и податливост към Dreamer Scale на мъжете. При отчитане на влиянието на образованието по VVQ се констатира, че високо визуални са респонденти с магистърска степен, а високо вербални – респонденти с докторска степен. По Dreamer Scale податливостта е най- голяма отново на респонденти с докторска степен. Резултатите от анализа на ковариацията (ANCOVA) показва, че потребителите на реклама с магистърска степен мъже са по-податливи към Verbalizer Scale, както и респонденти с докторска степен жени спрямо всички останали таргетирани групи. Тези научни резултати могат да бъдат полезни за рекламисти, маркетолози, както и на специалисти в когнитивната психология.

Ключови думи: вербално-визуални когнитивни стилове, рекламна сегментация, VVQ .

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Introduction

The verbal and visual components of advertising are a highly beneficial topic for exploration among researchers investigating cognitive styles – verbalizers versus visualizers, and some even as dreamers in information processing. In each advertisement, various visual and verbal effects are employed to influence consumers, and research is progressing in various directions. Researchers express different opinions on this matter in various fields (Wanta & Roark, 1994; Zillmann et al., 1999; Mendelson, 2001; Mendelson & Thorson, 2003). One perspective is that the intriguing aspects of visual information involve processing cognitive elements in advertising as a significant part of the consumer experience, evoking pleasant or unpleasant feelings (Lagerwerf et al., 2012, p. 1837). Furthermore, each metaphor in advertising can be interpreted differently by consumers with various characteristics. There is evidence that individual differences in personality and cognitive style affiliation influence how variables impact the ultimate responses of consumers. Despite these indications of effective influence, the researcher believes that the achieved effects on consumers belonging to different segments of the advertising audience are not sufficiently explored. This is the reason to explore new segments of users, divided into visualizers, verbalizers and dreamers, where other demographic characteristics are taken into account, as well as factors of achieved verbal-visual influence. In a number of scientific studies, the achieved effects of verbal-visual impact are discussed, but they have not sufficiently studied how the intangible benefits derive from the material aspects of the product or service offering (Phillips, 2000). In addition, it should be established in more detail which segments of consumers belonging to different genders and with different educational characteristics react more quickly to verbal-visual impact through advertising. In support of this statement are studies conducted in the late 1990s of the 20th century (Adaval & Wyer, 1998) and the beginning of the 21st century (Mattila, 1999), in which it was found that the use of narratives through pictures as a specific a type of visualization strategy, leads to more favorable evaluations of the various advertising media presented in the media. However, there is a need for new scientific evidence regarding the achievement of advertising effectiveness through verbalization and visualization as both user experience and user segmentation.

Literature review

The information processing process is complex and finds its empirical support, on the one hand, in the theory of limited capacity, in which a distinction is made between different channels of processing - visual and verbal (Lang et al., 2000; Lang et al., 2002), as well as in dual coding theory, where optimal coding of textual and visual information is observed (Paivio, 1986). In addition, research in the field of cognitive psychology shows that there are two types of information processing - verbal and visual or combined, because these are the two main components that make up any information system. Researchers have presented in their scientific works a number of different cognitive styles that can influence information processing and also directly relate to the perception of verbal-visual components in information processing (Witkin et al., 1977), in holistic and analytic processing, (Riding & Sadler-Smith, 1992), or reflective and impulsive processing (Holman, Snowman, & Deichmann, 1979). In media studies, scholars are interested in both cognitive styles and "viewing styles," or "patterns of behaviour involving choices that somehow influence attention and learning from television" (Miron, Bryant, & Zillmann, 2001, p. 157). Although viewing styles are related to learning styles, this concept of different cognitive styles is distinguished from individual learning styles. The issue in this direction needs to be more thoroughly researched and commented on, because it would make it easier for advertisers to create impactful advertisings. Other media studies on the perception of news messages have found that news photographs aid news processing in a variety of positive ways. Although support for this assumption has been mixed in social science research (Wanta & Roark, 1994; Mendelson, 2001; Mendelson & Thorson, 2003), research on how people learning from written material and images suggests that newspaper stories and pictures are the same for everyone as a way of perceiving but not as a way of responding. There are assumptions about the stronger influence of verbal elements, called verbal anchors, among print media, as well as greater resistance to the influence of visual elements in electronic media products. In other studies, the emphasis falls on visualization or achieving effectiveness in advertising through visual anchors. It should be pointed out that the visualization strategy in the media space, is based on the concept of vividness (Mittall, 1999). Ortony, Clore and Collins found in a number of their studies that vivid pictures as impact material are more persuasive because they arouse consumer interest (Ortony, Clore & Collins, 2011). In turn, Keller, Punam and Block concluded that vivid information is easier for the user to perceive and process than non-vivid information (Keller et al., 1997), but according to Carolyn Tripp (1997) not all advertising media focus on the use of vivid, tangible cues (Tripp, 1997). In some cases, they rely on the content, the story that the picture itself tells, as well as the presence of verbal elements that attract the user's attention and stimulate interest.

Another approach to the interpretation of verbalization, according to information processing, is its perception and experience as part of contextual advertising. Assuming that one form of verbalization describes what we "perceive" more adequately than other perceivers, it tells us how we convert our "perceptions" into categories and concepts (Forceville, 1996, p. 133). From the previous studies, verbalization forms in advertising can be identified as several syntactic structures and the differences between them have been studied by many researchers (Forceville, 1996; Mashal et al., 2014). The researchers found, particularly relevant to media studies, the relative predispositions of individuals to learn from visual and verbal materials, and how people's "visualizing" and "verbalizing" cognitive styles influence their response to the environment as well as their ultimate behaviour. A high "verbalization" user is characterized by being word-oriented, showing high fluency with words, preferring to read for ideas, and enjoying word games. High “visualizers” are characterized by being image-oriented, preferring to be shown, and enjoying visual games such as puzzles (Jonassen & Grabowski, 1993; Riding & Ashmore, 1980). In earlier studies, the selection of perceivers was made along the opposite continuum: verbalizer/visualizer as two main extremes, but according to more modern views expressed by Mendelson and Thorson (2004), the two positions are perceived as separate and independent concepts, as not people are thought to be only visually or only verbally inclined, but rather show variation in both concepts (Mendelson, & Thorson, 2004). The concept of visual-verbal learning styles is similar to the concept of visual and verbal literacy, although the latter is closer to an ability, since many scholars define visual literacy as the learned ability to understand and interpret visual elements (Scott, 1994). Studies in this direction are becoming the subject of examination by psychologists, with the goal being to explain many individual personality traits of the learners, as well as of the perceivers of various media products in particular. These claims are supported by educational research that confirms that the presence of pictures during instruction increases comprehension of text passages when the accompanying pictures are appropriate to the text (Levie & Lentz, 1982). Therefore, the segmentation of advertising consumers into separate groups with specific characteristics would facilitate the understanding of the perceived nature of verbal-visual information, as well as provide clarity on the question of the ultimate reactions of consumers to products and services.

Methodology

The purpose of the present study is to segment advertising users into several groups - verbalizers, visualizers and, according to the adapted and modified scale of Kirby, Moore and Schofield (1988) - Verbalizer-Visualizer Questionnaire (VVQ), as well as dreamers. Another research objective is to determine how gender and education of consumers affects the cognitive affiliation of respondents perceiving verbal-visual advertising information. To achieve this goal, the Verbalizer-Visualizer Questionnaire (VVQ) was applied as a reliable and valid instrument for measuring cognitive orientation. The study included 425 respondents who answered the Verbalizer-Visualizer Questionnaire (VVQ) to determine their cognitive affiliation of Kirby, Moore and Schofield’s scale, consisting of 30 statements, with 10 statements defining high verbalizers, 10 high visualizers, and 10 high dreamers. The research methods are related to the following studies (Hair et al., 2003): 1) measuring the cognitive affiliation of users by the Verbalizer-Visualizer Questionnaire (VVQ) according; 2) segmentation of advertising consumers by gender and education, as well as their susceptibility to the Verbalizer-Visualizer Questionnaire (VVQ); 3) establishing some causal relationships between cognitive affiliation and some demographic characteristics of the respondents. Respondents answer all modules of the questionnaire using a five-point Likert-type scale, which includes ratings from 1 - Disagree to 5 - Agree. Cronbach's alpha was used to test the reliability of an adapted and modified version of the VVQ. The reliability of Verbalizer Scale is $\alpha=0.722$, the reliability of Visualizer Scale is $\alpha=0.739$, the reliability of Dreamer Scale is $\alpha=0.734$, For the whole sample, the Cronbach's alpha coefficient is $\alpha=0.783$. Since the values are close to or exceed the minimum recommended value of $\alpha=0.700$ (DeVellis, 2012), the internal consistency for the respective subscales is sufficiently high, i.e. the elements that compose them form a common scale.

Results and discussion

The study was conducted in the period from September 2022 to September 2023. Self-reported data were collected from a total sample of 425 respondents distributed across gender and education age, ensuring a 95% representative size (being e = ± 5%; p = q = 0.50). Each case from the general population was equally likely to be included in the study. All respondents filled in the questionnaire on paper because this ensures the correctness of the answers. According to these criteria, the total sample was 39.3% male (167 people) and 60.7% female (258 people); and according to the education – 11.8 % (50 people) – Secondary school completed, 39.3% (167 people) – Higher secondary school completed, 18.1 % (77 people) – Bachelor degree completed, 22.8% (97 people) – Master degree completed, 8% (34 people) – PhD completed. To determine whether the adapted and modified scale of Kirby, Moore & Schofield, (1988) applied in the study was suitable for analysing the data obtained, a confirmatory factor analysis was carried out using a method of principal components (PCA) and orthogonal rotation using the Varimax method with Kaiser Normalization (Kaiser, 1974). 3 factors were determined as in the methodology of Kirby at el., (1988), with the first factor comprising 6 statements measuring dream vividness, a second factor combining 6 visualization statements, and a third factor consisting of 6 statements, measuring verbalizers. The remaining statements, which are of lower factor bodies and do not form a factor, are not included in the formation of the three factors. According to some authors, only statements with factor weights greater than 0.500 should be analysed, that is, these are statements with the greatest weight and should play an important role for subsequent measurements (Ganeva, 2016, p. 340). To ensure the fit of the data, several well-known diagnostic checks were performed: 1) 30 statements showed correlations above 0.500 or higher with other items in the VVQ; 2) The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.697 for the entire sample (N = 425), which is above the recommended value of 0.600 (Kaiser, 1974). 3) Bartlett's test of sphericity was statistically significant for all subjects ($\chi_{2\ (435)} = 4115.9$, $p < 0.000$), (Bartlett, 1954). The measure of adequacy was checked, as well as the adequacy for each subscale of the VVQ questionnaire, obtaining the following values: for Verbalizer Scale KMO was 0.689; for Visualizer Scale KMO was 0.734; for Dreamer Scale KMO was 0.612. Bartlett's tests of sphericity for each subscale were also statistically significant for all subjects ($p < 0.000$), (Bartlett, 1954).

To determine the influence of Verbalizer-Visualizer Questionnaire (VVQ) on different groups of respondents formed by gender, a one-way analysis of variance (ANOVA) was applied. The hypothesis that the arithmetic means of the persuasive principles were different with respect to gender was also tested, and the results of the one-factor analysis of variance (ANOVA) are presented in Table 1.

Table 1.
Influence of gender on susceptibility to VVQ (ANOVA)

Independent variable	Dependent variable	F	p	Mean (Male)	Mean (Female)
Gender	Verbalizer Scale	F=6.87	p < 0.01	3.05	3.26
	Visualizer Scale	F=0.003	p =0.999	2.72	2.72
	Dreamer Scale	F=7.39	p < 0.01	3.03	2.82

Results indicated that gender influenced susceptibility to the visualization subscale and the dreaming subscale, and overall susceptibility to persuasion was in the hypothesized direction. Susceptibility to visual information was achieved to a greater extent in women compared to men, where $F=6.87$; $p < 0.01$; $x_{2\ (women)} = 3.26$; $x_{1\ (male)} = 3.05$, and susceptibility to information stored through dreams is achieved to a greater extent in males than in females, where $F=7.39$; $p < 0.01$; $x_{1\ (men)} = 3.03$, $x_{2\ (women)} = 2.82$, (Table 1). According to research in this direction, it can be argued that some individuals prefer visual information and products that emphasize the visual, as well as others who prefer written or verbal information. In our study, visual information, as well as information constructed in dreams, is essential because visual information processing differs from verbal information processing, as cognitive development affects the number of revisions as well as the duration of image fixation (Lang et al., 2002). Most of the results obtained support this correspondence, with researchers recommending that future studies focus on the relationship between cognitive elaboration and imagery evaluation in general. (Lang et al., 2000; Graesser et al., 2005; Rayner et al., 2001). It should not be underestimated that some consumers use less verbal material and rely primarily on images when perceiving information from various sources, especially from an advertising medium (Riding & Douglas, 1993). According to the obtained results, women are shaped as better visualizers, that is, they perceive information visually faster, and men are better dreamers, that is, they create pictures with dreams. Previous studies have found that users differ in their propensity to remember details from verbal and visual information (Riding et al., 1995). Further causal relationships between other demographic characteristics and susceptibility to Verbalizer-Visualizer Questionnaire (VVQ) should be found in future studies.

To determine individuals' susceptibility to verbal-visual cognitive styles shaped by education, a one-way analysis of variance (ANOVA) was applied. The results of the one-way analysis of variance (ANOVA) are presented in Table 2.

Table 2.
Influence of education on verbal-visual cognitive styles (ANOVA)

Independent variable	Dependent variable	Mean	F	p-values
Education	Visualizer Subscale	x_1 (secondary school) = 3.07 x_2 (Higher secondary school) = 2.98 x_3 (Bachelor degree) = 3.05 x_4 (Master degree) = 3.59 x_5 (PhD) =3.36	F=11.20	p < 0.000
	Verbalizer Subscale	x_1 (secondary school) = 2.83 x_2 (Higher secondary school) = 2.63 x_3 (Bachelor degree) = 2.89 x_4 (Master degree) = 2.57 x_5 (PhD) = 2.99	F=3.73	p <0.005
	Dreamer Subscale	x_1 (secondary school) = 2.94 x_2 (Higher secondary school) = 3.02 x_3 (Bachelor degree) = 2.76 x_4 (Master degree) = 2.71 x_5 (PhD) = 3.10	F=3.74	p < 0.005

The results show that education affects the respondents' susceptibility to each of the cognitive styles, with the greatest susceptibility observed on the Visualizer Subscale, where F=11.20; p < 0.000, and individuals with a master's degree have the highest values - $x_{4\ (Master\ degree)}$ = 3.59. On the other subscales, it is found that the F values are very close, such as on the Dreamer Subscale F=3.74; p < 0.005, and the highest values are for individuals with a doctoral degree - $x_{5\ (PhD)}$ = 3.10 and on the Verbalizer Subscale F=3.73; p < 0.005, and the highest values are for individuals with a doctoral degree - $x_{5\ (PhD)}$ = 2.99, (Table 2). The highest and lowest mean values for the three subscales are presented. Because cognitive style is an individual's typical and consistent approach to acquiring, processing, and organizing information (Riding et al., 1995), it is very important to interpret cognitive styles as "individual variations in the way of perceiving, remembering and thinking, or as different ways of understanding, sorting, transforming and using information" (Kogan, 1971, p. 244). In addition, we all differ in the way we interact with different information from different sources, which is also related to the knowledge we have acquired, argue other authors (Jonassen & Grabowski, 1993). Therefore, in processing information by the large inclinations of the studied individuals to visual information for individuals with a master degree, it is defined as an adaptive approach in the learning processes, because individuals with PhD show greater inclinations to verbal information, or information constructed at dreams. Styles themselves are considered a subset of personality because style is a fixed characteristic of an individual (Jackson & Lawty-Jones, 1996). In addition, cognitive styles differ from learning strategies, which are defined as ways used to deal with situations and tasks (Riding & Sadler-Smith, 1992), but they also differ from abilities, which refer to levels of skills (Jonassen & Grabowski, 1993). Of particular interest in this scientific work are the results derived from the relationship between cognitive style and educational affiliation, because although they are not related to individual abilities, they show the verbal-visual tendencies of the examined persons in relation to acquired education. It should not be forgotten that our data are a snapshot of the problem at hand, and the search for more dependencies remains to be done in studies from different subject areas.

In order to establish causal relationships between gender and education the analysis of covariance (ANCOVA) was performed. To achieve this goal by applying an analysis of covariance (ANCOVA), (Field, 2013) the author can have determined whether there was a difference in susceptibility to one of the Verbalizer Scale and their acquired education (Kirby, Moore, & Schofield, 1988). In this analysis, the dependent variable is the verbalization subscale, education is used as the covariate because it is assumed that education and gender, measured simultaneously, can be controlled for in the statistical analysis when it comes to cognitive abilities. A new variable was introduced, and the respondents were divided according to the criterion of education with different age characteristics: 11.8% (50 people) with secondary education (under 18 years old); 39.3% (167 people) with secondary special education (under 25 years old); 18.1% (77 people) with a bachelor's degree (over 25 years old); 22.8% (97 people) with a master's degree (over 25 years old) and 8% (34 people) with a doctoral degree (over 25 years old). The reason for this distribution is for the covariate to be a continuous quantitative variable. Before performing the ANCOVA, the following assumptions were checked: 1) checking the correlation between the verbalization scale and the covariate - user education as Pearson's correlation is a weak positive correlation - r=0.222; p<0.000, which means that the linear relationship is less than r<0.800; p<0.000; 2) the dependent variable is normally distributed - the values of the coefficients for asymmetry (Skewness) are -0.532, and for (Kurtosis) kurtosis are -0.342, that is, relatively close to zero, (Ganeva, 2016); 3) homogeneity of variation, i.e. similar variations were observed across groups. Before proceeding with an analysis of covariance (ANCOVA), it is necessary to present the means for the Verbalizer Subscale and education, before accounting for the interaction effect. Means before analysis of covariance (ANCOVA) are presented in Table 3.

Table 3.
Mean of Verbalizer Scale and education of respondents

Verbalizer Subscale / Education		Means	N	Std. Deviation
Male	Secondary school	Mean= 2.82	28	0.725
	Higher secondary School	Mean =2.60	72	0.694
	Bachelor degree	Mean= 2.69	27	0.581
	Master degree	Mean= 2.88	25	0.743
	PhD	Mean= 2.84	15	0.704
Female	Secondary school	Mean= 2.85	22	0.980
	Higher secondary School	Mean= 2.65	95	0.835
	Bachelor degree	Mean =3.00	50	0.940
	Master degree	Mean= 2.47	72	0.586
	PhD	Mean= 3.11	19	0.807

Male respondents with a master's degree and female doctoral respondents had the highest means: Mean=2.88 and Mean=3.11 on the Kirby et al. (1988) Verbalizer Subscale, with similar standard deviations, indicating that the subscale in each group is equally dispersed. It is assumed that the education of the respondents with different age characteristics can be influenced by the gender of the subjects on the measured subscale, therefore a covariance analysis (ANCOVA) is applied. The results of the analysis of covariance are as follows: Levene's test is statistically insignificant - p=0.318, which indicates that the group variances are equal and the assumption of homogeneity of variance is not violated (Ganeva, 2016); The results of the analysis of covariance (ANCOVA) are presented in Table 4, (Table 4).

Table 4.
Influence of gender on Verbalizers Scale according to education (ANCOVA)

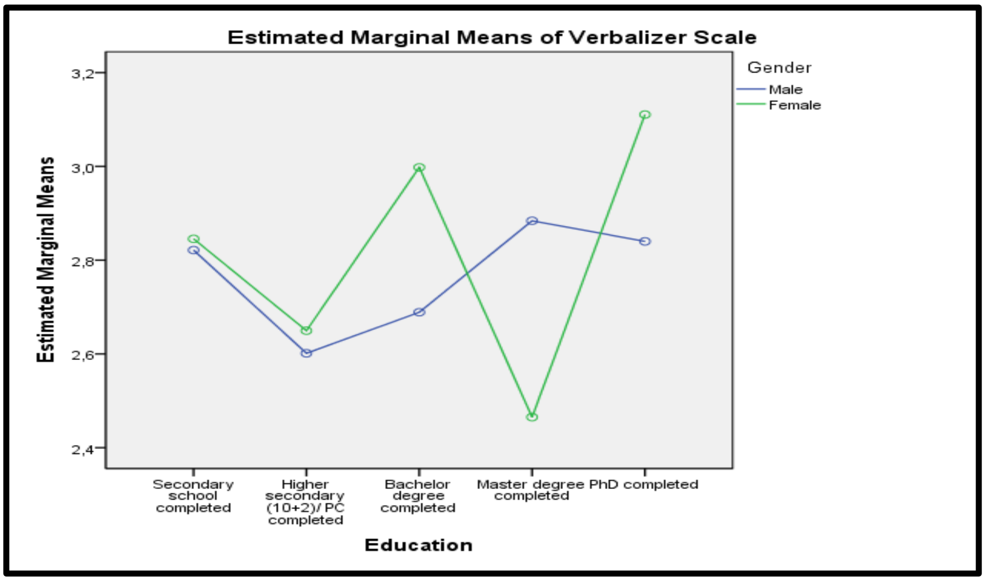
Verbalizer Subscale	df	Mean Square	F / p-values	Partial Eta Squared
Gender	1	0.162	F=0.277;p= 0.599	
Education	4	1.366	F= 2.34; p < 0.05	0.01
Gender/Education	4	1.399	F=2.39; p < 0.05	0.22
Error	415	0.584	Adju. R Squared = 0.052.	0.23
Total	425			

A statistically significant interaction effect of respondents' gender and education was found on the Verbalizer Subscale, where $F_{(4,415)} = 2.39$, $p < 0.05$, eta = 0.23, which according to Cohen (1988) is a medium effect size. The Partial Eta Squared results indicated that more than 2% of the variance of the dependent variable - Verbalizer Subscale was predicted by education, with Adjusted R Squared = 0.052, (Table 4). The two independent variables were analyzed separately and the main effect for the independent variable gender was not statistically significant $F_{(1,424)} = 0.277$, $p< 0.599$ in the analysis of covariance (ANCOVA), i.e. there was no statistically significant difference when the Verbalizer Subscale was applied by gender. The main effect for the other independent variable – education was statistically significant, where $F_{(4,415)} = 2.34$, $p < 0.05$, because there was a statistically significant difference in the measurement of Verbalizer Subscale by education. Cohen's interpretation of eta, $0.24 \leq \eta < 0.37$, indicated that a weak effect size value was observed, eta = 0.22. After performing the analysis of covariance, the adjusted means for the study groups are presented in Table 5, controlling for the covariate – education with age difference, (Table 5).

Table 5.
Adjusted means for Verbalizers Subscale controlling for the covariate (ANCOVA)

Verbalizer Subscale / Education		Means	Std. Error
Male	Secondary school	Mean= 2.82	0.144
	Higher secondary School	Mean=2.60	0.090
	Bachelor degree	Mean=2.69	0.147
	Master degree	Mean=2.90	0.153
	PhD	Mean=2.84	0.163
Female	Secondary school	Mean=2.85	0.078
	Higher secondary School	Mean=2.65	0.108
	Bachelor degree	Mean=3.00	0.109
	Master degree	Mean=2.57	0.090
	PhD	Mean=3.15	0.175

After analysis of covariance (ANCOVA) it is found that male and female with master degree have an interaction effect, with the mean values for men being - Mean=2.90 and for women - Mean=2.57, therefore the effect is greater for male with Master degree relative to women of the same group. The second interaction effect is for respondents with a doctorate degree, with the average values for men being - Mean=2.85 and for women - Mean=3.15, therefore the effect is greater for women with master degree than men of the same group, (Graph 1). The results showed that susceptibility to the Kirby et al. (1988) - Verbalizer Subscale was determined by gender, with the intersection of the arithmetic means of users with a master's degree and a doctorate confirming an interaction effect when combined measuring respondents' education, (Graph 1).



Graph 1. Susceptibility to Verbalizer Subscale on gender and education.

The significance of the latter measure indicates that gender as a factor can determine susceptibility to the Verbalizer Subscale only when the subjects' education is also taken into account. Such statistical significance could not be established by the one-way analysis of variance (ANOVA) that was performed on the gender distribution. These results confirm the findings of other researchers who indicate that verbalization in all its dimensions: "verbal anchors," (McQuarrie & Phillips, 2005) "documentation," (Mattila, 2000) "verbalization styles on memory" or "styles of cognitive verbalization,"cognitive user preferences," (Kirby, Moore, & Schofield 1988) "verbal structures" (Phillips, 2000), is associated with certain semantic operations, because they have different interpretations among individual users, and education is also measured in our analysis. Establishing a relationship between different factors characterizing individuals when processing verbal components can contribute to a more accurate understanding of the processes taking place when processing verbal information. In addition, researchers find a relationship between visual metaphors and verbal structures in advertisings because the former aid the perceived essence of the latter in individuals' interpretation of information (McQuarrie & Phillips, 2005).

Conclusion

In the processing information, researchers very often look for dependencies between the cognitive affiliation of individuals and their final reactions to verbal-visual information. The present study attempted to segment respondents into verbalizers, visualizers, and dreamers, finding that on the Verbalizer-Visualizer Questionnaire (VVQ), and female respondents are susceptible to the Verbalizer Scale, and male respondents are susceptible to the Dreamer Scale. No statistically significant results were found on the Visualizer Scale. Therefore, women process verbal information in advertising more easily, and men respond positively to information that is induced by the vividness of the dream. When segmenting users according to the criterion of education, it was found that highly visual abilities are possessed by individuals with a master's degree, and verbal by users with a doctoral degree, that is, with an increase in educational abilities in various qualification and scientific fields, respondents show verbal abilities more than visual abilities. On the subscale measuring dream vividness, the biggest dreamers again appeared to be advertising consumers with doctoral degree.

The researcher of the present scientific paper also made additional measurements, and different solutions were sought, but a statistically significant result was found when measuring respondents' gender and education at the same time, inferring susceptibility to the Verbalizer Scale. Male advertising consumers with a master's degree are more susceptible to the Verbalizer Scale than female advertising consumers of the same degree. The second interaction effect was female with doctoral degree respondents who were most receptive to the Verbalizer Scale relative to all other target groups. The significance of the latter measure indicates that gender as a factor can determine susceptibility to the Verbalizer Subscale only when the subjects' education is also taken into account. These results confirm the findings of other researchers who indicate that verbalization in all its dimensions: verbal anchors, documentation, verbalization styles on memory or styles of cognitive verbalization, cognitive user preferences, verbal structures, is associated with certain semantic operations because have different interpretations among individual users, and education is also measured in our analysis. In our study, a strong response was observed on the part of men with a master's degree and women with a doctorate degree to verbal information. These scientific results can serve many advertising researchers, some marketers, as well as cognitive psychology and communication specialists to properly segment advertising consumers.

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The discourse of American and British political interviews

Дискурс американського та британського політичного інтерв'ю

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Abstract

The aim is to conduct a comparative analysis of the political discourse of Great Britain and the United States, in particular the study of the speech style of the leaders, the context and the role of the media in the formation of public opinion. Methods. The study employs the method of analysis of lexical units, the linguistic method of field structures, and the method of stylistic analysis of markers. Standard methods of mathematical statistics were used, as well as Cronbach's alpha to check the reliability of the research methods. Conclusions. The study reveals the importance of the media's role in political discourse, especially in the dissemination of political interviews and their public perception. A comparison of UK and US political discourse reveals both similarities and differences in the communication of political leaders, and helps analyse each country's response to common challenges and issues. Prospects. Further research could focus on gendered aspects of political speech, including the analysis of the gender's role in shaping

Анотація

Мета. Порівняльний аналіз політичного дискурсу Великобританії та США, зокрема вивчення стилю мовлення лідерів, контексту та ролі медіа в формуванні суспільної думки. Методи. У дослідженні використано метод аналізу лексичних одиниць, лінгвістичний метод польових структур, метод стилістичного аналізу маркерів. Також було використано стандартні методи математичної статистики, а також коефіцієнт альфа-Кронбаха для перевірки надійності методів дослідження. Висновки. Дослідження вказує на вагомість ролі медіа в політичному дискурсі, особливо у поширенні політичних інтерв'ю та їх сприйнятті громадськістю. Порівняння політичного дискурсу Великобританії та США розкриває як схожі, так і відмінні аспекти комунікації політичних лідерів, а також допомагає аналізувати реакцію кожної країни на спільні виклики та проблеми. Перспективи. Майбутні дослідження можуть фокусуватися на гендерних аспектах політичного мовлення, включаючи аналіз ролі гендеру у формуванні

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political discourse and identifying gender stereotypes.

Keywords: media influence, political discourse, markers of influence, public opinion, corpus analysis.

політичного дискурсу та виявлення гендерних стереотипів.

Ключові слова: вплив медіа, політичний дискурс, маркери впливу, суспільна думка, корпусний аналіз.

Introduction

Relevance

The relevance of the issue under research is determined by the desire to understand political changes and communication in society. Political communication is an important factor of social and political processes, which contributes to the understanding and determining the main aspects of political events, strategies, and ideologies. Political interviews are a tool for politicians to communicate with the public, reinforcing the importance of analysing their discourse in this context. Current research shows that the language used by politicians during interviews affects their perception of both individuals and their political programmes. Establishing the relationship between the language form and the content of the interview provides an insight on how language creates or transforms public opinion and influences electoral behaviour (Williams & Sovacool, 2019).

Political discourse is an extremely important element of public communication, reflecting the way in which politicians communicate their views, ideas and strategies to voters. The study of political discourse makes it possible to better understand the essence of political processes, as well as to study how the way of expression affects the perception of politicians and their political programmes. A comparative analysis of UK and US political discourse reveals interesting differences and similarities in the communication strategies of both countries (Table 1).

Table 1.
A comparison of the political discourse of Great Britain and the United States

Aspects of political discourse	*Great Britain*	*United States*
Leaders	Traditionally, British political leaders display complexity and formality in their speech, using elegant vocabulary and rhetorical devices.	A more direct and simple style of speaking of leaders, often a lack of formality and the use of vernacular expressions can be noted in the US political interviews in the United States.
Political topics	British political discourse often focuses on issues related to the parliamentary system, the monarchy and European affairs.	In the US, political interviews have a greater emphasis on national and international issues such as the economy, migration, and global security.
Depth of analysis	British politicians often show deeper analysis of issues and detailed elaboration of policy arguments in their responses.	American politicians often use more general statements and corrupt elements of rhetoric in political interviews.
Public rhetoric	British political interviews are often marked by sophisticated rhetoric and formal images.	In the US, public rhetoric often relies on finding similarities with the audience and using common analogies.
Media context	The UK has a tradition of a rich media landscape with numerous major newspapers and media.	The US media context includes a rich spectrum of print, television, and online media that differ in specifics and political influence.

Source: created by the authors based on Brown & Mondon (2021)

Both countries use political discourse as a means of communicating with the public and expressing their ideas and positions. However, the approaches are marked by differences in style, emphasis, and strategies. Individual style, deep knowledge and emotional loading are emphasised in the US, while the UK follows a traditional and formal approach, with an emphasis on public discussion and historical traditions (Cremer, 2023).

Comparison of political interviews in the US and the UK reveals common issues and challenges facing these two countries, including but not limited to economic and sociocultural aspects, migration processes, as well as climate change and geopolitical disputes. Discourse analysis of political interviews can reveal specific approaches and strategies for responding to common problems, expanding the understanding of political discourse in different countries (Seppälä, 2022).

Features of international relations and global politics create additional interest in political interviews in the USA and Great Britain. Both countries play a key role in world events and international relations. Comparing political interviews in these countries allows us to reveal their positions, strategies and approaches to global issues. This awareness is crucial for understanding international processes (Segev, 2020).

The role of the media in political processes is most clearly manifested in the spread of political interviews. As a factor in the formation of public opinion, the media play a significant role in the analysis of political discourse. Understanding the influence of the media on political interviews and public opinion is critical to analysing the social implications of this communication process. (Roulin et al., 2023).

Aim. The purpose of this article is a comparative analysis of political discourse in Great Britain and the United States, with an emphasis on its forms and influence on public opinion.

Objectives/questions

1. Analyse the discourse of a political interview in order to identify markers of influence.
2. Identify the peculiarities of the field structures of political interview discourse in Great Britain and the United States.
3. Analyse the stylistic differences between the political interview discourse of Great Britain and the United States.

Literature review

The study of political discourse helps to understand the formation, development of political processes and their influence on the society. Analysis of the language and communications of politicians reveals their views, strategies, and goals. Political discourse has an unconditional influence on public opinion and attitudes to key issues of socio-economic life. The study of discourse helps to identify messages and arguments that have the greatest influence on electoral decisions and citizens' opinion.

Cervone, Augoustinos & Maass (2021) examine the language used to express contempt and hatred. The authors study the functions of this language, its consequences, and possibilities of reuse. The article analyses the impact of expressive language on the perception and attitude of others. It makes a significant contribution to understanding the use of hate speech in contemporary political discourse.

Druckman, Gubitz, Levendusky & Lloyd (2019) study the impact of incivility and aggression in partisan media on the political polarisation of voters. They explore how negative tone and political media engagement influence the division of citizens and their political beliefs. The article discusses how certain dynamics can either contribute to or reduce political divisions.

Farhall, Carson, Wright, Gibbons & Lukamto (2019) address political degradation and its variants, including incivility, contempt, and demonisation in political communication. The authors analyse the impact of these phenomena on parliamentary and public discourse, providing a comprehensive study of the topic in their collection of works titled Political Debasement. This work is a valuable contribution to the understanding of political communication and its effects on society.

Gervais (2019) examines the effects of incivility and anger on political behavior and attitudes. The author explores how incivility in political debates can provoke partisan conflicts and affect citizens' readiness for successful discussion. The article provides a significant contribution to understanding the influence of elite communication on political processes.

Hickman & Huaylla Sallo (2022) study the political economy of public space redistribution projects using the examples of Aldgate Square and Bank Junction in London. Aldgate Square and Bank Junction. The study examines important aspects of political economy and urban spatial planning.

Lilja (2022) explores forms of resistance and discourses of resistance. The author proposes the concepts of 'inverted discourses', spatial resistance, and network protest as key aspects for analysing contemporary social resistance. The study offers a new perspective on resistance manifestations in modern global society, particularly through the lens of joint network activity and spatial organisation.

Otto, Lecheler & Schuck (2020) examine the impact of media obscenity on citizens' perceptions of political messages in three European countries. The study suggests that the influence of vulgar language in the media can be context-dependent. It is important to consider the cultural and political conditions when analysing media influence on society. Pickard, Bowman & Arya (2020) examine youth activism in Britain, focusing on young environmental activists. The article explores the socialisation of young activists, their motivations, and their protest actions. It sheds light on how young people in Britain influence political and environmental issues and what ideologies drive them.

Rangoni, Bedock & Talukder (2023) look at the discourse of parliamentarians. The article examines the correlation between parliamentarians' competence and their legitimacy in the context of the discussion. It aids in comprehending the perception of democratic innovations and their role in contemporary politics.

Wodak (2020) investigates the phenomenon of political discourse and its impact on current social and political processes. The author in particular analyses the normalisation of discourse on the far-right political spectrum and raises important questions about the proliferation of offensive and aggressive language in modern political debates. The author provides readers with an in-depth and critical look at the rise in popularity of far-right ideologies and discourse in different parts of the world. It examines political discourse based on a rich analytical approach that includes linguistic analysis and content analysis of the texts of political figures.

There are still unexplored issues about the influence of political discourse in social networks, the effectiveness of different strategies of speech influence on political decision-making, language dynamics in international relations, cultural and linguistic variations in political discourse, gender analysis of political speech and its impact on gender equality, as well as the influence of historical experience and linguistic memory on the formation of political discourse and historical events in political texts (Konotop, Bondar, Terletska, Kyrychenko and Ovsyanko, 2022). Further research is required to gain a deeper understanding of the role of political discourse in social and political processes.

Methodology

Design

Using a mixed-methods approach, this study sought to understand the formation and expression of political narrative by political actors through interviews by combining quantitative measures with qualitative textual analysis. Table 2 offers a detailed overview of the research stages, which allowed to structure and systematise the performed actions for greater clarity and consistency in the presentation of results.

Table 2.
Stages of studying the features of the discourse of the American and British political interview

Stages	Period	Content
Stage 1	February 2022 - March 2022	Defining the purpose and subject of the research in the context of the topic involves studying the dynamics of political interviews in American and British discourses. The purpose of the study is to uncover and analyse the differences in the discourse used in these two cultural environments as it pertains to political interviews. The subject of the study covers the specifics of language use, communication strategies, and language practices that characterise political interviews in the United States and Great Britain. The study included the analysis of not only verbal aspects of discourse but also non-verbal ones, such as facial expressions, gestures and other elements of non-verbal communication, which can be important in the communication process.
Stage 2	April 2022 - August 2022	Collection and analysis of material using lexical databases and software to identify stylistic means of political narrative. For this, not only the standard analysis of textual resources was used, but also specialised lexical bases and software aimed at identifying and analysing stylistic techniques in the political narrative.
Stage 3	September 2022 - May 2023	Collection and analysis of political interviews over the years for comparison, determining the percentages of frequency of use of stylistic means of political narratives.
Stage 4	June 2023 - October 2023	Analysis of research findings, preparation of a research paper with conclusions and discussion on differences and commonalities in the discourse of American and British political interview.

Source: created by the authors of the research

This approach made it possible to effectively combine qualitative and quantitative aspects of the analysis and to study more deeply the political narratives in the selected interviews. Such a methodology is aimed at creating a more complete and objective picture of the manner in which political leaders translate their views and ideas through language.

Despite using advanced techniques and tools, this study has several limitations that need to be acknowledged. First, the scope of the study may be limited by the availability and availability of relevant data sources. Despite efforts to collect material, limitations such as limited access to certain political interviews and incomplete transcriptions may limit the breadth of analysis.

Second, reliance on lexical databases and software to identify stylistic devices of political narrative introduces potential limitations. Automated tools tend not to accurately reflect nuanced linguistic features or context-specific elements, which can lead to possible omissions or misinterpretations in the analysis.

Participants

The study materials were selected based on important criteria to provide a meaningful and representative analysis. It is noteworthy that the volume of materials was significant, allowing for a multifaceted picture of political communication. Specifically, materials from Great Britain and the USA were considered, including 100 political interviews, speeches, public statements of politicians, and other textual materials.

The study's inclusion criteria were strictly defined. Only materials published between 2013 and 2023 were selected to ensure relevance and consideration of modern trends in political communication. Additionally, the selected materials had to be publicly available for further research.

The exclusion criteria were implemented to avoid the inclusion of irrelevant materials in the study. Non-political authors wrote the materials, and the sample excluded non-publicly available and pre-2013 or post-2023 publications to ensure relevance.

The study utilised the Oxford English Corpus, the largest English language corpus with over 2 billion word usages. This corpus represents the present state of the English language worldwide. It mainly comprises texts created since 2000, which are mostly available online on the World Wide Web. Additionally, the corpus includes textual materials stored on paper media, such as technical manuals, articles from newspapers and magazines, works of fiction, and other documents of various genres and origins.

Instruments

For a more comprehensive analysis of text data, this study used Google Cloud Machine Learning Engine - a powerful platform for data processing and analysis. This tool made it possible to study in more detail the linguistic and semantic aspects of language in texts, as well as their contextual changes over time. To ensure the reliability of the selected tools, the principles of the analysis of representative samples, which have proven themselves well on various data sets, were used.

Data collection

1. The study utilised lexical analysis to identify markers of manipulative influence in political discourse. Based on this analysis, thesaurus groups of words were created to analyse political discourse in Great Britain and the United States. This classification of narrative units of discourse helps to influence mass consciousness (Washburn, Klages and Mazur, 2023).
2. The field structure linguistic method is an analytical approach in linguistics that aims to study the relationships between linguistic units in a text to identify the structural and semantic characteristics of speech. This method allows speech to be considered as a complex system in which each linguistic unit interacts with others to create a meaningful context (Richards-Gray, 2022).
3. The method for analysing the style of political discourse is based on identifying stylistic features that indicate the presence of political narratives. This may include references to morality, choice, welfare, and other forms of populism. Lynggaard (2019) used this method to identify political content in the different types of content under research.

Analysis of data

1. Average statistical value is used to calculate the average frequency of word inclusion in the corpus.
2. The optimal value is used to determine the critical value in the sample.
3. The Cronbach's alpha reliability coefficient indicates the internal consistency of the test

items. The Cronbach's alpha is calculated according to the formula:

$$\frac{N}{N-1}\left(\frac{\sigma_x^2 - \sum_{i=1}^{N}\sigma_{Y_i}^2}{\sigma_x^2}\right); \quad (1)$$

where σ_x^2 *– total test score variance;*

$\sigma_{Y_i}^2$ *– variance.*

Ethical criteria

The study adheres to the highest standards of academic integrity and protects the rights and welfare of research participants because it is founded on ethical principles within academia. It is important to adhere to the norms of speech and cultural features of English journalistic discourse, avoiding offensive or inappropriate expressions. The research was conducted objectively and critically, avoiding any bias or distortion of the results. The results are published in accordance with academic standards and include proper references.

Results

The analysis of markers of political influence in English-language discourse is crucial for various reasons. It reveals the intricacies and nuances of how political leaders shape public opinion and how politics and political processes are conveyed through language. Table 3 displays the identified markers of political influence in English-language discourse.

Table 3.
Markers of political influence in the English-language discourse

Marker	British political discourse	American political discourse
Appeals to emotions	appeal, emotion, touch, feel, care, concern, anger, outrage, fear, hope, dream, vision, change, hope, future, better	appeal, emotion, touch, feel, care, concern, anger, outrage, fear, hope, dream, vision, change, hope, future, better
Appeals to values	value, principle, belief, moral, ethical, right, wrong, fair, just, equality, freedom, democracy, liberty, progress, change, better	value, principle, belief, moral, ethical, right, wrong, fair, just, equality, freedom, democracy, liberty, progress, change, better
Appeals to logic	reason, logic, fact, evidence, proof, analysis, argument, conclusion, policy, plan, solution, change, future, better	reason, logic, fact, evidence, proof, analysis, argument, conclusion, policy, plan, solution, change, future, better
Appeals to authority	expert, authority, study, research, data, statistic, report, conclusion, policy, plan, solution, change, future, better	expert, authority, study, research, data, statistic, report, conclusion, policy, plan, solution, change, future, better
Appeals to action	call to action, vote, support, donate, protest, march, petition, contact, legislator, official, change, future, better	call to action, vote, support, donate, protest, march, petition, contact, legislator, official, change, future, better

Source: created by the authors based on the research results

The table shows common markers of political influence in British and American political discourse. These markers, including appeals to emotions, values, logic, authority, and action, are used in both contexts to create effective communication strategies for political leaders. The identified markers suggest that both discourses actively employ similar communicative strategies to achieve political goals. Appeals to emotions and values help connect with the public, while appeals to logic and authority provide appropriateness and approval of decisions. Appeals to action encourage activism and participation in the political process. Table 4 presents the frequency of use of the identified markers.

Table 4.
Analysis of the frequency of use of markers of political influence

Marker	British political discourse	American political discourse
Appeals to emotions	15%	15%
Appeals to values	20%	20%
Appeals to logic	25%	25%
Appeals to authority	20%	20%
Appeals to action	20%	20%

Source: created by the authors based on the research

It can be determined from the table that markers of political influence appear with approximately the same frequency in the British and American political discourse. Each of the five appeal markers (emotions, values, logic, authority, and action) accounts for about 20-25% of the total number of markers in each discourse. Appeals to emotions are important in both discourses and account for 15% of the total number of markers. This indicates that the use of emotional arguments in political communication is a general practical approach. Appeals to values, logic, authority and action are also found in both discourses with the same frequency, which indicates the importance of these aspects in political communication. Appeals for values can be aimed at influencing the moral beliefs of the audience, logic helps to argue political positions, authority creates trust in political leaders, and action emphasises the need for specific steps or decisions. Table 5 presents a comparison of the field structures in the discourse of UK and US political interview.

Table 5.
Comparison of the field structures in the discourse of UK and US political interview

Field	British political discourse	American political discourse
Government institutions	Parliament, government, law, police	Congress, the President, the Constitution, the Supreme Court
Political actions	Vote, protest, fight, change	Vote, rally, demonstrate, fight
Political values	Freedom, equality, justice	Freedom, equality, justice, the American dream
American identity	America, American, human rights, democracy	America, American, freedom, democracy
Political ideologies	Liberalism, conservatism, socialism	Liberalism, conservatism, socialism
Political problems	Economic inequality, weapons, climate change	Economic inequality, weapons, climate change

Source: created by the authors based on the research

In British political discourse, there is a higher focus on institutions of power and political action. Great Britain has a long history of parliamentary democracy and constitutional monarchy, which is reflected in political discourse. Political leaders of Great Britain often turn to traditional political institutions that ensure stability and legitimacy of the system. The main topics of the discourse often concern issues of political reforms, legislative work, and public administration. Table 6 presents quotes illustrating field structures.

Table 6.
Illustration of field structures in the discourse of UK and US political interview

Field	British political discourse	American political discourse
Institutions of power	“The role of Parliament is to hold the government accountable.” - Boris Johnson, Prime Minister of the United Kingdom (BBC News, 2023)	“The Constitution is the foundation of our democracy.” - Joe Biden, President of the United States (The Independent, 2022)
Political actions	“We must stand up for what we believe in, even if it means protesting.” - Keir Starmer, Leader of the Labour Party (Malnick, 2023)	“The right to vote is the most important right we have.” - Kamala Harris, Vice President of the United States (Herndon, 2023)
Political values	“Freedom of speech is essential to a healthy democracy.” - Liz Truss, Foreign Secretary of the United Kingdom (The Guardian, 2023)	“Equality is at the heart of the American dream.” - Barack Obama, former President of the United States (Herndon, 2023)
American identity	“We are a nation of immigrants, and we are proud of that.” - Rishi Sunak, Chancellor of the Exchequer (ITV News, 2023)	“We are a country of opportunity, and we must always strive to live up to that ideal.” - Bernie Sanders, Senator from Vermont (CNN *Politics*, 2023)
Political ideologies	“Conservatives believe in a smaller government and lower taxes.” - Jeremy Hunt, former Chancellor of the Exchequer (The Guardian, 2023)	“Liberals believe in a strong social safety net and a more active role for government.” - Alexandria Ocasio-Cortez, Representative from New York (Herndon, 2023)
Political issues	“We must address the issue of economic inequality.” - Nicola Sturgeon, First Minister of Scotland (Sky News, 2023)	“We must take action on climate change.” - Elizabeth Warren, Senator from Massachusetts (CNN *Politics*, 2023)

Source: created by the authors based on the research

The British discourse focuses more on political institutions, while the American discourse focuses more on American identity and political ideologies. The United States of America is a country with a great diversity of cultures, ethnicities, and ideas. Therefore, American political leaders often resort to appeals to the American national image and identity to involve citizens in political action. Political debates in the US often centre around key ideologies such as conservatism, liberalism, socialism, and others.

These differences in discourses reflect the historical paths and evolution of the political systems of both countries. They also influence the way political leaders communicate with citizens and shape political realities according to the unique demands of their national audiences. Understanding these differences is important for analysing political processes and for studying the impact of political discourse on society in these countries.

Stylistic analysis of markers of influence in the political discourse of the interview reveals the peculiarities of the use of linguistic means to achieve the communicative goal. In this case, the goal is to influence the audience, to shape its attitude to political events and persons. Table 7 presents a comparison of the field structures of political discourse in Britain and the USA.

Table 7.
Comparison of the field structures of political discourse in Great Britain and the USA

Criterion	Great Britain	USA
Use of influence markers	Widely used	Widely used
Audience orientation	Orientation to a wide audience	Orientation to a wide audience
Use of images and metaphors	Often used	Often used
Using an emotional component	Moderate use	Active use
Using a logical component	Moderate use	Active use
Using an authority component	Moderate use	Active use

Source: created by the authors based on the research

By comparing the political discourse of Great Britain and the United States of America based on the table above, several important differences and similarities in their field structures can be identified. Both discourses make extensive use of influence markers and are oriented towards a wide audience, indicating their focus on mass communication and influence on society.

Regarding the use of images and metaphors, both discourses often employ these stylistic devices to illustrate political positions and ideas. However, there is a notable difference in the emotional component employed by American and British discourse. American discourse actively utilises emotional influence to engage citizens, while British discourse uses emotions less and employs a more moderate use of this component. American discourse actively utilises emotional influence to engage citizens, while British discourse uses emotions less and employs a more moderate use of this component.

In terms of the use of the logical component, American discourse displays a more active use of logical arguments, which may suggest a more thorough analysis and justification of political positions. Conversely, the use of this component in British discourse is more moderate, which may indicate less emphasis on logical arguments.

Additionally, the authority component is also prominent in American discourse, which may recommend the significance of support from authorities and experts. In British discourse, the use of this component is moderate, which may indicate less emphasis on authority. The analysis recommends that political discourse in both countries is a complex construct, in which the use of different structures and components depends on the strategies of political leaders and the specifics of each national audience.

Discussion

The study of political discourse in the United States and Great Britain has contributed significantly to understanding the communication of political leaders and their influence on public opinion. Allsop (2019) and Feldman (2022) also cover the influence of cultural and historical contexts. This research confirms that political discourse has a significant impact on shaping public opinion and that this impact is highly dependent on cultural and historical contexts. The specifics of political discourse in the USA and Great Britain reflect their history, values, and sociocultural features.

The analysis emphasises the crucial role of the media in spreading political discourse and influencing public opinion. The media serves as a mediator between political leaders and the public. Their decisions on what information to convey and how to convey it are crucial in shaping public opinion. These findings are supported by Feldman (2023) and Ferrara, Haas, Peterson & Sattler (2022). The authors also emphasise the role of the media in conveying political narratives. Instead, Navera, (2021) and O'Grady, (2022) point out that alternative sources of information, such as social networks, play a significant role in the dissemination of political narratives.

Importance of further research. Our study opens up opportunities for further research in the field of political discourse. It is important to study the factors that influence the evolution of political discourse over time, as well as the effective communication strategies that may emerge in the future. The study of how political discourse dynamics are changing and how they affect public opinion and political decision-making is critical in light of the rapid development of modern communication technologies and the globalisation of information space. Sievert et al. (2022) and von Soest (2023) have emphasised this point.

Perreault, Kananovich & Hackett (2023) and Szabó, Kmetty & Molnár (2021) discuss academic objectivity. Research findings emphasise the importance of academic objectivity and methodological purity in the analysis of political discourse. This ensures the reliability and objectivity of grounded conclusions.

As noted by Sievert et al. (2022), comparing political interviews in the United States and Great Britain revealed differences in character, tone, and negotiation strategies.

The study showed that political interviews in the US aim to impress and support the individual image of the politician by using emotional arguments and emphasising personal qualities. Political interviews in British discourse are characterised by argumentation and factual data, emphasising formality and rhetoric. Both options have common features, such as question avoidance strategies, speech triangles, and euphemisms, reflecting a general political communication approach in light of current sociocultural trends.

The study provides a better understanding of the role of political discourse in shaping public opinion, reveals its connection with cultural and historical contexts, and emphasises the importance of effective communication by political leaders. This statement highlights the importance of effective communication by political leaders for the development of political communication and the formation of political strategies in the modern world.

Further analysis of political discourse can lead to the development of new communication strategies in politics and contribute to the improvement of intercultural understanding in political relations. The obtained results can positively impact the formation of political programs, the resolution of controversial issues, and the interaction between different political parties. This approach can contribute to building a constructive political dialogue and developing sustainable and effective governance in the modern world.

It is important to consider the methodological limitations of this study when interpreting the results. It is critical to note that this study only analysed publicly available political interviews. Private communications of political leaders, such as internal meetings or closed-door discussions, were not available for analysis, which may limit the full understanding of political discourse. Additionally, the analysis of political discourse focused solely on public statements and interviews, without taking into account the context behind the scenes. Furthermore, significant aspects such as the intentions and strategies of political leaders that were not expressed in their public speeches may remain unrevealed. This study has limitations in that it only analysed English-language political discourse in the United States of America and Great Britain, which may result in a limited view of global political discourse. It is indispensable to note that this study was based on publicly available data and textual materials. Therefore, the quality of the data and their presentation were limited by the quality and availability of the sources.

Conclusions

Relevance. The chosen topic's relevance lies in the fact that political discourse is a crucial tool for influencing public opinion and shaping political processes. In today's world, where information and communication spread rapidly through technological means, the study of political discourse is of utmost importance.

Understanding how politicians use language to influence citizens and how the public perceives and responds to political messages is crucial for the development of democratic societies and ensuring an objective and informed public. The research findings indicate that political discourse plays a critical role in shaping public opinion and political processes. The analysis of political interviews in American and British contexts has shown that politicians' language greatly influences the public's perception of political leaders and their programs. Specifically, we found that politicians' speaking style can be a powerful tool for shaping their image and public perception. An analysis of the context and topics discussed indicates that political interviews reflect the current issues and challenges faced by both countries. The study indicates that the media plays a crucial role in political discourse. They influence the distribution of political interviews and shape public perception. The text ends with the word 'Applications.' A comparison of political discourse in the United Kingdom and the United States can reveal similarities and differences in the communication styles of political leaders and how each country responds to common challenges and problems. The research results can be applied in various contexts. They are particularly relevant to political science and linguistics, as they help to enhance the understanding of how political discourse shapes public opinion and political processes. The data obtained contribute to a deeper analysis of the role of language in political communication and provide a foundation for further research in this area. The study's results should be considered from different angles, considering both its potential impact and limitations. They can influence the communication strategies of politicians during election campaigns, making them more effective and attractive to voters. In addition, the obtained data can serve as a basis for developing new theories and methods of political discourse analysis in scientific research. The study contributes significantly to a better understanding of the relationship between the speech practices of political elites and public perception from a sociocultural perspective. Although the study has certain limitations, such as limited access to materials and the potential influence of the researchers' personal preferences, these do not detract from the overall importance and validity of the findings. To achieve a more complete and unbiased understanding of political discourse, future studies should broaden the study's scope, use various methods of analysis, and adhere to objective criteria. Additionally, this research has practical applications in political marketing and communication strategies for political candidates. This can lead to more effective political campaigns and better engagement with voters. Future research could focus on identifying gender stereotypes in political texts and analysing the role of gender in shaping political discourse.

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The use of innovative technologies for teaching the humanities

Використання інноваційних технологій при викладанні гуманітарних дисциплін

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Abstract

The study of the flipped classroom methods is important for improving the quality of education and the effectiveness of learning in the context of modern technological changes and growing interest in distance education. The aim of this study was to determine the effectiveness of the use of the flipped classroom model in learning a foreign language for professional purposes. Testing was used to diagnose the effectiveness of assimilation of educational material, which included various types of tasks: multiple response, error correction, matching, fill in the blanks, open-ended tasks, completed responses. The total number of tasks is 25 (5 for each type) and questionnaires to determine the level of satisfaction with educational video materials and online learning. Tests and questionnaires were pre-validated according to the research objectives. The obtained results ($\chi^{2emp} = 8.095 > \chi^2$ 0.05 = 7.815) gave grounds to conclude that

Анотація

В контексті сучасних технологічних змін та росту інтересу до дистанційної освіти, дослідження та вдосконалення методів перевернутого класу стають важливими завданнями для підвищення якості освіти та ефективності навчання. Це дослідження мало на меті визначити, наскільки використання моделі перевернутий клас є ефективним у процесі вивчення іноземної мови за професійним спрямуванням. Для діагностики ефективності засвоєння навчального матеріалу було застосовано тестування, яке включало різні типи завдань: вибір кількох відповідей, виправлення помилок, пошук відповідностей, заповнення пропусків, завдання з відкритою відповіддю, закінчені відповіді. Загальна кількість завдань – 25 (по 5 для кожного типу) та анкетування з метою визначення рівня задоволеності навчальними відео-матеріалами та онлайн навчанням. Тести та анкети були

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the blended learning model of flipped classroom in the development of foreign language competence is more effective than traditional learning. The experiment showed that this format helps students implement an individual learning trajectory, which contributes to improving academic performance. It was determined that the effectiveness of using this model depends on the quality of video materials and students' ability to organize their own independent work. The prospects of further research фку the study of the influence of the application of the flipped classroom model on the students' learning motivation.

Keywords: innovative learning technologies, blended learning, distance learning, flipped classroom, the Humanities.

попередньо валідизовані відповідно до цілей дослідження. Отримані результати ($\chi^{2емп}$ = 8,095 > χ^2 0,05 = 7,815) дали змогу зробити висновок про те, що змішана модель навчання перевернутий клас при формуванні іншомовної компетенції, має перевагу у своїй ефективності перед традиційним навчанням. Як показав експеримент, цей формат допомагає студентам реалізовувати індивідуальну траєкторію навчання, що сприяє поліпшенню навчальних показників. Результати дали змогу визначити, що ефективність викоритання технології залежить від якості відео матеріалів та здатності студентів до організації власної самостійної роботи. Перспективою подальших розвідок є дослідження впливу застосування моделі перевернутого класу на мотивацію студентів до навчання.

Ключові слова: інноваційні технології навчання, змішане навчання, дистанційне навчання, технологія перевернутий клас, гуманітарна підготовка.

Introduction

The rapid growth of information flows requires the abandonment of reproductive learning based on knowledge transfer. The main goal of education is to develop students' self-learning and goal-setting ability, the ability to learn independently and achieve set goals, to creatively use existing knowledge and skills to solve new non-trivial both professional and personal tasks. The transition to a mixed form of education in connection with the Covid-19 pandemic and the invasion of the Russian Federation on the territory of Ukraine required updating methods of working in remote mode, the search for the most effective models of the organization of education.

So, there is a need to shift to learning models that shape and develop students' ability and readiness for lifelong learning (Gok et al., 2023).

Blended learning is currently widespread. This is a pedagogical approach that combines elements of traditional education and education with the use of information and communication technologies. There are several generally accepted options for implementing blended learning. For example, Staker and Horn (2012) proposed a classification of blended learning based on the role of technology and the time students spend in different learning environments. These are the Lab Rotation Model, the Rotation Model, the Flex Model, the A La Carte Model, and the Enriched Virtual Model.

The term “flipped classroom” was introduced into educational practice in the early 2000's and arose as a reaction to the growing availability and use of video materials and online resources in education. The concept of flipped classroom became popular thanks to the researchers and educators Bergmann and Sams (2012), who actively developed and popularized this pedagogical approach.

The idea behind the flipped classroom is to change the traditional learning model. The flipped classroom approach aims for more interactive and engaged learning, where students actively interact with the material and with each other, and the teacher acts as a facilitator. This approach became popular in education and made it possible to revise traditional teaching methods.

However, the issue of empirical research of the effectiveness of this method remains open despite significant studies of the effectiveness of this type of blended learning, as well as the advantages and disadvantages of the flipped classroom model in academic discourse.

Therefore, the aim of this research is to study the effectiveness of using the flipped classroom model in learning a foreign language.

The aim involved the fulfilment of the following research objectives:

- study the effectiveness of the learning of educational material after the implementation of the flipped classroom model and compare it with the traditional method;
- determine the level of students' satisfaction with the learning process based on the flipped classroom model and support in online learning;
- evaluate students' satisfaction with educational video materials who studied with the use of the flipped classroom model.

In the next section, an analysis of the scientific sources of the identified problem is carried out. The "Methodology" section describes the diagnostic methods used, the sample, the research base, and the ethical criteria for its conduct. The "Results" section presents the obtained static data of the study. In the "Discussion" section, the results are interpreted and compared with other studies. The conclusions summarize the results and define the prospects for further research.

The conducted research provides grounds for wider implementation of the modified learning model "inverted classroom" in the educational process of educational institutions. The results that were obtained contribute to updating the teaching methodology of humanitarian disciplines in a mixed format.

Literature review

The analysis of recent publications made it possible to single out a number of English-language terms associated with the concept of mixed learning: blended learning, hybrid learning, flipped learning.

Blended or hybrid learning should not be confused with flipped classroom. In a blended learning, the teacher replaces part of the classroom sessions with remote ones, but the method of conducting the lesson and the distribution of didactic roles may remain unchanged (Yajie & Jumaat, 2023). Flipped classroom is only one of the models of the implementation of blended learning, in which classroom sessions focus on exercises, laboratory, and practical research, while new material is learnt offline with the help of online technologies and the use of opportunities of the digital educational environment (Horban et al., 2022).

According to Valizadeh and Soltanpour (2020), the flipped model of blended learning is an approach based on active learning.

The flipped classroom can be more beneficial compared to the traditional methods that are mostly used in higher education (Vitta & Al-Hoorie, 2023). However, it will not be more useful in other educational stages where traditional approaches are not usually used, for example, in primary education (Galindo-Dominguez, 2021; Tretiak et al., 2021).

Therefore, using this model is most effective in higher education, where most of the information is learned by students during independent work. Jdaitawi (2019) notes that the flipped classroom strategy can be used to promote self-regulated learning and strengthen students' social connections.

Turan and Akdag-Cimen (2020) note that the flipped classroom method in learning English for professional purposes has gained popularity among researchers after 2014, and the number of studies in this field has increased rapidly in recent years.

A literature review on the effectiveness of the introduction of blended learning into the educational process of foreign language teaching (Al-Harbi & Alshumaimeri, 2016; Afzali & Izadpanah, 2021) gave grounds to identify the main pros and cons of this methodology. In the last 15 years, blended learning has become more innovative, modern, and productive compared to classroom education and pure online learning (Konotop et al., 2023; Tang et al., 2023).

Students got the opportunity to study where, how and how much they want. Today, universities around the world offer 3 learning options: online, classroom, or blended. And as experimental research in this field shows, the latter type takes the lead (Halasa et al., 2020). Surveys confirm the students' desire to study in a mixed format, which makes it possible to combine studies with their interests, work, obtaining additional education, and also brings a number of financial benefits (Košir et al., 2022). An enhanced motivation and autonomy is also noted among the positive sides, which is especially important when learning foreign languages, along with the development of critical thinking (Colomo-Magaña et al., 2020; Laura-De La Cruz et al., 2022). According to Strelan et al. (2020), a major positive factor influencing the effect of the flipped classroom is the opportunity it provides for structured active learning and problem solving. The results of a study by Mandasari & Wahyudin (2021) showed that the flipped classroom learning model has proven itself well in teaching grammar.

Among the disadvantages, many methodologists point to the fact that this format of learning is not suitable for all students because of the low level of competent planning and time allocation skills, which is characteristic of junior students (Velde et al., 2020).

In addition, the disadvantages include an increased load on the teacher caused by the need for a detailed development of the pedagogical design of blended learning: the selection of content, teaching methods, forms of control, the distribution of activities in classroom sessions and in the electronic educational environment, as well as taking into account factors that contribute to the formation of sustainable motivation in students (Kawinkoonlasate, 2019). The main challenges of this method common to all subjects relate to the length of the video/digital materials and the time required for teachers to prepare the learning materials and for students to learn them (Al-Samarraie et al., 2020), and that teachers and students should be technologically literate or ICT literate (Ngo & Yunus, 2021).

Thus, blended learning has significant potential to improve the quality of education, but its success depends on careful planning and preparation. In the context of foreign language teaching, students get more flexibility regarding the place and time of learning. Blended learning promotes the development of critical thinking and structured active learning. However, some of the challenges of blended learning include the need for teachers to plan and develop pedagogical designs and the need for a high level of technological literacy on the part of both teachers and students. Elementary students may find it difficult to learn a foreign language in this format due to their low level of planning and time management skills.

Methodology

Research Design

The research was conducted in several stages: preparatory, implementation stage, and the stage of analysis of the obtained results.

At the preparatory stage, we studied the theoretical prerequisites for creating a blended learning model. The following factors were taken into account when creating the pedagogical design: the readiness of the educational institution to implement blended learning; goals of introducing the course; the possibility of students to work remotely (availability of a computer, high-speed Internet); the number of academic hours that will be realized in the online format; days and number of hours for classroom sessions; selection of educational platforms to be used for online assignments.

The implementation stage (January 2023 to June 2023) involved conducting a pedagogical experiment at the experimental institutions. The experimental research was carried out during the study of the academic subject English for Professional Purposes. The educational load for the classes in the experimental group based on the flipped classroom model (48 academic hours of the semester) was divided into two components: 16 hours of online classes and 32 hours of classroom (offline), of which 16 hours are contact work with the teacher and 16 hours – in groups on projects.

The following methodical equipment was used for the implementation of the flipped classroom: a textbook (Hughes, J., Naunton, J. Business Result. Intermediate Student’s Book with Online practice); computer workbook (Business Result Intermediate Interactive Workbook); the educational platform Microsoft Teams, which hosted educational videos for independent study of theoretical material; Google Forms for testing; BBC Learning English site; Google Slides for online project tasks.

The stage of analysis of the obtained results involved collection, processing of research data, and their interpretation.

Sample

The following universities were the experimental base of the study: Shevchenko National University “Chernihiv Colehium”, South Ukrainian National Pedagogical University named after K. D. Ushinsky.

The experimental study involved a total of 81 students of the second year of study. During the research, 2 groups were selected: experimental (n = 40) and control (n = 41). The participants of the experimental group (EG) were taught using the flipped classroom model. Participants of the control group (CG) were taught using traditional educational methods.

Methods

Testing was used to diagnose the effectiveness of learning the educational material, which included the following types of tasks: choosing multiple responses (Multiple Response), correcting errors, finding correspondences, filling in the blanks (Fill in the Blanks), tasks with open-ended answers (Open-ended). The total number of tasks is 25 (5 for each type). The maximum possible number of points for the test is 25. Evaluation criteria: "excellent" — the number of correct answers is 25-22; "good" — the number of correct answers is 21-18; "satisfactory" — the number of correct answers is 17-13; "unsatisfactory" — the number of correct answers is ≤ 12.

A questionnaire consisting of 6 questions with multiple answers was developed in order to identify advantages in the use of information technologies in educational activities. The survey was conducted using Google Forms.

A survey of EG participants was conducted in order to determine the level of satisfaction with educational video materials. Satisfaction with the educational course was evaluated using a numerical scale from 1 to 5.

Instruments

The non-parametric Pearson's chi-squared test was used to compare the frequencies of quality indicators in independent groups. The value of the $\chi 2$ criterion was compared with the critical values $(r – 1) \times (c – 1)$ of the number of degrees of freedom. If the empirical value of the $\chi 2$ criterion exceeded the critical one, it was concluded that there is a statistical relationship between the risk factor being studied and the result at the appropriate level of significance. The critical level of statistical significance when testing the null hypothesis was taken as equal to 0.05. Two-sided variants of the criteria were used in all cases. The data were processed using STATISTICA 13.3 developed by StatSoft.Inc and Microsoft Office Excel 2010.

Ethical Criteria

The respondents' participation in the study was voluntary, the principles of protecting the rights of research participants, ensuring their safety and data privacy were observed in the process of data collection. The research was based on the principles of impartiality and objectivity.

Results

Before and after the experiment, the participants were asked to answer the questions of the questionnaires developed by the authors of the study (Table 1).

Table 1.
The results of a student survey regarding the experience of using online learning and support in the flipped classroom format

Item No.	Questions of the questionnaire	Answers: Before the experiment	Answers: After the experiment
1.	To communicate with the teacher on educational matters in extracurricular hours, you…		
	Use a personal account in a social network	83%	77%
	Contact the teacher personally at the educational institution	31%	20%
	Call the teacher	25%	13%
	Use messengers Viber, WhatsApp, etc.	13%	35%
	Use e-mail	13%	25%
2.	What kind of support would you like to receive during the online course?		
	Group conversation in social networks	33%	30%
	Teacher's consultation in messengers/social networks	58%	70%
	Discussion on the course forum	46%	65%
	Face-to-face consultation with the teacher	83%	55%
3.	Mark the statements that are correct about you.		
	I discuss educational issues with my friends, including in the conversations of our study group	85%	88%
	I ask questions about independent work to the teacher	88%	87%
4.	What kind of teacher's help do you need when performing independent work?		
	Explanation of the task	73%	70%
	Consulting and adjustments	60%	75%
	Regular control of task completion	13%	20%

5.	Verification and analysis of results	44%	60%
	Mark the statements that are correct about you.		
	I work in the distance learning system of the institute in extracurricular hours (not during classes)	88%	90%
	I am doing additional work on the subjects (not at the teacher's task)	44%	56%
	I'm engaged in independent learning on the subjects being studied at the external online courses	8%	15%
	I would agree to take a short-term (up to 4 weeks) online course instead of preparing a thematic presentation	85%	75%
	I think that taking an online course is easier than studying offline	90%	65%
	I get into work faster if the time to complete the task is limited	48%	40%
	When choosing an online course, I would prefer a course without time limits (deadlines)	56%	54%
6.	Doing independent work is a challenge for me….		
	as I don't understand the purpose of the work	60%	63%
	as I don't understand the task	75%	77%
	as I don't know how to complete the task	58%	50%
	as I cannot determine for myself whether the completed task is complete and correct	29%	35%
	as it is difficult for me to allocate time correctly	13%	55%

After the implementation of the flipped classroom model, the number of students who use personal accounts in social networks to communicate with the teacher has significantly decreased (from 83% to 77%). The number of students who contact the teacher personally at the institute has also decreased (from 31% to 20%). Instead, more students started using messengers like Viber, WhatsApp, etc. (from 13% to 35%).

After the implementation of the flipped classroom model, the popularity of consultations in messengers/social networks increased from 58% to 70%, and discussions on the course forum — from 46% to 65%. Group chat on social networks remained a popular support option. There is also a slight increase in the number of students who discuss academic issues with their peers (from 85% to 88%). At the same time, students who ask questions to the teacher remained at approximately the same level (88% to and 87%).

After the implementation of the flipped classroom model, the number of students in need of counselling and correction (from 60% to 75%), as well as verification and analysis of results (from 44% to 60%), increased. Students' answers to the question about the difficulty of independent work remained at almost the same level, but after the implementation of the flipped classroom model, it became more difficult for students to correctly allocate time (from 13% to 55%).

The general trend is that students are more active in using messengers and social networks to communicate with the teacher and receive support during the online course. The learners' activity also increased in their requests for teacher support during independent work.

Table 2 presents the results of the comparison of the groups among themselves according to the Input Testing and Final Testing indicators.

Table 2.
Comparison of independent groups according to the Input Testing and Final Testing indicators

Indicator		Experimental group	Control group	Statistical significance of differences	
				χ^2	P
ENTRY TESTING	excellent	8 (20%)	7 (17%)	0.418	0.937
	good	12 (30%)	11 (27%)		
	satisfactory	14 (35%)	15 (37%)		
	unsatisfactory	6 (15%)	8(19%)		
FINAL TESTING	excellent	16 (40%)	8 (20%)	8.095	0.045
	good	14 (35%)	12 (29%)		
	satisfactory	10 (25%)	18 (44%)		
	unsatisfactory	0 (0%)	3(7%)		

Note: χ^2 – chi-squared test, p – statistical significance of differences.

Statistical analysis of the data for the Input Testing indicator showed that with the number of degrees of freedom k = 3, $\chi^2 = 0.418$. The critical value of χ^2 at the significance level of $p < 0.05$ is 7.815. The relationship between the factor and result features is not statistically significant, the level of significance is $p = 0.937 > 0.05$. So, no statistically significant differences between the frequency distributions of the two groups were found at the stage of input testing.

Statistical analysis of the data for the Final Testing showed that with k = 3, the value of χ^2 is 8.095, which is greater than the critical value of $\chi^2 = 7.815$ at the significance level of $p = 0.05$. The relationship between the factor and the resulting features is statistically significant, the level of significance is $p = 0.045 < 0.05$. Therefore, the results obtained after the pedagogical influence give grounds to conclude that the method used in the experimental group has an advantage in its effectiveness.

We also conducted a survey on the students' satisfaction with educational video materials who studied using the flipped classroom model (Table 3).

Table 3.
The results of students' satisfaction with educational video materials who studied using the flipped classroom model

Item No.	Quality criteria of educational video materials	*m±S* (Group1)	*m±S* (Group 2)
1.	Clarity and accessibility	4.9±0.12	4.7±0.37
2.	Consistency and structure of the educational material	4.7±0.23	4.75±0.4
3.	Practical focus	4.8±0.25	4.75±0.23
4.	Image and sound quality	4.77±0.36	4.5±0.5
5.	Duration and tempo	4.80±0.32	4.7±0.43
6.	Relevance of questions and tasks	4.85±0.25	4.41±0.54
7.	Availability on different devices	4.8±0.23	4.83±0.27
8.	The ratio of time spent and knowledge gained	5.0±0.00	4.3±0.67
9.	General impression	4.85±0.23	4.7±0.25

Note: Here m – mathematical expectation; S – standard deviation.

Therefore, students who studied under the flipped classroom model showed a high level of satisfaction with educational video materials. Most aspects such as clarity, accessibility, consistency and structure, practical orientation, and availability on different devices received high marks. However, the image and sound quality may require improvement, recording such videos requires special technical equipment. There is also a difference in estimates of the ratio of time spent and knowledge gained, which also needs to be refined.

Discussion

Despite the fact that blended learning appeared in the early 2000's, its use in teaching foreign languages in general and business English to students of secondary vocational education in particular does not have a long tradition. Moreover, the issue of the effectiveness of the application of this educational model remains open (Hotle & Garrow, 2016).

The conducted experiment shows that unlike the traditional teaching method, where the teacher presents all the content and students often become passive listeners, the implementation of flipped learning contributes to the improvement of students' language skills, transforming them into active agents, which is confirmed by previous studies (Hotle & Garrow, 2016; Afrilyasanti et al., 2016). At the same time, the practice has shown that it is possible to avoid increasing the teacher's load with the help of preliminary preparation for the introduction of a new teaching format (Kawinkoonlasate, 2019).

The study confirms the conclusions of a number of researchers (Phoeun & Sengsri, 2021; Abdullah et al., 2019; Safiyeh & Farrah, 2020) about the validity of the flipped classroom model in mixed education of students of non-linguistic majors. By the end of the semester, the EG students showed higher results of the lexico-grammatical skills on the studied communicative topics provided by the programme of the subject Foreign Language in Business Communication compared to the CG, who were taught in a traditional way, which allowed us to confirm our hypothesis about the effectiveness of the selected training model. This is also confirmed by the research of Al-Naabi (2020).

The most likely reasons for this result include students' interest in a new learning format: modern youth perceive information technologies as an integral attribute of their lives, so tasks performed using Microsoft Teams or YouTube aroused their genuine interest (Košir et al., 2022). Besides, new grammatical material was explained to the EG students online: special educational videos were posted in Microsoft Teams, which they could watch them at any convenient time and an unlimited number of times. This format gave them an advantage over the students of the control group, who got acquainted with the new grammar material in the classroom once, and if they were not in class, they had to study the questions on their own, and helped to easily and quickly repeat any topic. The ability to work in project teams remotely from home saved time that could be spent directly on the project rather than commuting, and had a positive effect on the performance of such tasks (Di Marco et al., 2020).

It is also worth noting that by the end of the semester, the level of linguistic competence has increased in both the EG and CG. This, of course, shows that traditional methods of teaching a foreign language have not lost their significance, and contact work with the teacher is necessary for a foreign language, but the introduction of modern technologies of blended learning, in particular the flipped classroom model, allows improving the educational process (Horban et al., 2022).

The main limiting factors of the study are that the experiment was conducted during one semester, and only full-time students were involved in the diagnosis.

The prospects for further research include the application of a blended learning model for students of the 1st-2nd year and the comparison of the obtained results with the results of the senior students' performance in connection with the lack of an unequivocal opinion regarding the age restrictions of the implementation of this technology in the educational process. A study of the flipped classroom model's impact on students' learning motivation is also promising.

Conclusions

The flipped classroom model has become a relevant and vividly discussed topic in the current educational environment, as it modernizes the traditional approach to learning. This model gives students more control over their learning, promotes active involvement in the learning process, and can improve learning. The study of the flipped classroom model is important for the development of innovative teaching methods and optimization of the educational process.

Despite the importance of using blended learning and online learning in general, educational programmes face many challenges related to the application and implementation of a blended learning model in the curriculum. These problems can be technical (the students' and teachers' ability to successfully use technology) and/or organizational (adaptation of the educational programme, change of curricula). It is necessary to carefully plan the ratio of online and offline lessons, the choice of teaching methods and forms of control to achieve the desired results of English language learning, as well as to record higher quality lecture materials.

This study found that flipped classroom blended learning model helps students to realize an individualized learning trajectory that contributes to improved academic performance.

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Implementation of virtual reality in foreign language teaching

Впровадження віртуальної реальності у викладання іноземної мови

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Abstract

The article highlights the main features of the virtual educational environment, the advantages and formats of using virtual reality in learning a foreign language. The purpose of the article is to study the role and possibilities of virtual reality as a necessary component in learning a foreign language.
The methodological concept is aimed at shaping the role and capabilities of virtual reality as a necessary component in foreign language learning.
The results of the study show the importance of the main modules of the multimedia virtual environment for learning cultures and languages in institutions of higher education; the technology of writing a pedagogical script for a computerized course is proposed for the design of distance courses for learning a foreign language, the construction of a high-quality virtual language environment, and the methods of using virtual reality tools are presented.

Анотація

У статті виокремлено основні риси віртуального освітнього середовища, переваги та формати застосування застосування віртуальної реальності при вивченні іноземної мови. Метою статті є вивчення ролі і можливості віртуальної реальності як необхідного компонента у вивченні іноземної мови.
Методична концепція спрямована на формування ролі та можливостей віртуальної реальності як необхідної складової у навчанні іноземної мови.
У результатах дослідження показано важливість основних модулів мультимедійного віртуального середовища вивчення культур та мов у закладах вищої освіти; запропоновано технологію написання педагогічного сценарію комп'ютеризованого курсу для проектування дистанційних курсів вивчення іноземної мови, побудови якісного віртуального мовного середовища та представлено способи

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The experimental work was devoted to the study of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, perception in the process of using virtual reality educational programs. The change of attention, which is closely related to the functioning of cognitive processes, was also studied.

Keywords: virtual reality, learning a foreign language, virtual language environment, training of specialists, cognitive processes.

застосування інструментарію віртуальної реальності.
Експериментальна робота була присвячена вивченню ролі та можливостей віртуальної реальності як необхідного компоненту при вивченні іноземної мови; ступеня зміни пам'яті здобувачів вищої освіти, операційних характеристик мислення, сприйняття в процесі використання освітніх програм віртуальної реальності. Досліджувалась і зміна уваги, яка тісно пов'язана з функціонуванням пізнавальних процесів.

Ключові слова: віртуальна реальність, вивчення іноземної мови, віртуальне мовне середовище, підготовка фахівців, пізнавальні процеси.

Introduction

All over the world, in the educational process of higher educational institutions, various technologies are widely implemented, which play a very important role in the educational space, and provide interactive learning in educational institutions, because full involvement in the educational process stimulates the student's brain activity and, with the help of observing the most realistic picture, increases success in the acquisition of knowledge and motivation of students of higher education. Such technologies include augmented reality and virtual reality. The application of virtual reality technologies in the field of education considered a special information environment and simulated by a computer, is a new innovative approach to the presentation and learning of educational material in which all objects are presented in three dimensions (Khmil et al., 2023).

A distinctive feature of such an innovative environment is experiencing the effect of the presence of a person and changing images in real-time. Virtual reality simulates exposure and reactions to this exposure. Recently, virtual reality technologies have evolved from being dubious and promising to be widely implemented and used. Today, virtual reality technologies in education in general and foreign language learning, in particular, are the development of cognitive skills, an additional opportunity to use innovations, and increasing interest in the discipline (Trach, 2017).

The search for new approaches to the organization of the educational process of a higher school involves a rethinking of the very content of education, that is, the introduction of new educational constructs into vocational training, the introduction into the educational process of higher education institutions of effective pedagogical technologies, methods and forms of learning when learning a foreign language (Dashko & Dubytska, 2019).

But, despite the importance of virtual reality technology, and the need to spread this technology as one of the experimental methods of learning in the educational process, we note that there are very few real studies of virtual reality in pedagogy. This can be explained only by the recent use of virtual reality in the educational processes of institutions of higher education and when learning a foreign language, the high material costs of these studies, the complexity of implementation in the educational process, and not only in a specific country but in the world as a whole.

Therefore, we are interested in the role and possibilities of virtual reality as a necessary component in learning a foreign language.

Advantages of virtual reality:

- Enhance learning opportunities (virtual reality provides a unique and immersive learning experience by immersing users in a virtual environment. Such an immersive approach improves memorization and understanding of complex concepts during memorization).
- Realistic training simulations (provides a safe and controlled environment for conducting various training simulations. This allows to reduce the number of errors and increase the efficiency of work in professions with high requirements).

Disadvantages of virtual reality:

- High cost (the equipment needed to work with virtual reality is quite expensive, in particular, we are talking about a headset, powerful computers and additional accessories).
- Health problems (long-term use of virtual reality leads to various health problems, such as motion sickness, eye strain, dizziness. In addition, isolation in a virtual reality environment can negatively affect mental health and social interaction.
- Lack of social interaction (virtual reality often involves individual interaction, which limits the possibilities of social connections in the real world).

The possibilities of virtual reality help in learning foreign languages. After all, the most effective method of learning a language is the method of immersion in life situations and conversations. A feature of such programs is changing images in real time and experiencing the effect of presence. You can communicate with virtual ones characters in different places and situations. Thus, not only communication skills are improved, but language barriers are also overcome. The process of learning foreign languages is significantly accelerated.

The following main questions are considered in the article: the features of the virtual educational environment; the main advantages of using virtual reality when learning a foreign language; formats of using virtual reality in learning a foreign language; the best virtual reality projects for learning a foreign language; content and construction of a virtual language environment for learning a foreign language; the main modules of the multimedia virtual environment for the study of cultures and languages in institutions of higher education; the technology of writing a pedagogical script for a computerized course for designing distance courses for learning a foreign language and building a high-quality virtual language environment; virtual reality as a necessary component in learning a foreign language; ways of using virtual reality tools; the key criteria for training specialists; show the experimental study of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, perception in the process of using virtual reality educational programs.

Literature Review

Various investigations have addressed the use of virtual and augmented reality in education, including its implementation in the educational process of higher education institutions. Thus, L. Taranhul & S. Romaniuk (2022) studied the role and experience of using augmented reality technologies in the educational process of higher education institutions, revealed its limitations and advantages (the HP Reveal platform) associated with its use in the educational space, which allows improving teaching methods and visualizing educational information. A. Torianyk (2019) also considered the disadvantages and advantages of augmented and virtual reality technologies in education. The scientist proved that virtual programs cannot completely replace traditional teaching in higher education institutions. However, they can make learning easier, especially when learning the most difficult topics, including languages. Yu. Trach (2017) also summarized the experience of studying the possibilities of using virtual reality technologies in the educational process. The disadvantages and advantages of using these technologies in education are given. N. Khmil, T. Halytska-Didukh, & Q. Wang (2023) showed the relevance, prospects, and expediency of using virtual reality technologies, analyzed their possibilities in the educational process, and also showed the disadvantages and advantages of using these technologies in education. D. Yefimov (2021), the purpose and functions of this technology are formulated by Yu. Matviienko (2021). The scientist analyzed applications implemented with AR technology, which are expedient to use in the educational process of a higher school. This is the problem, the use of virtual and augmented reality in the context of mixed learning was dealt with by V. Kovalenko, M. Marienko, & A. Sukhikh (2021), which are defined as separate applications that can significantly increase the effectiveness of such educational process.

Osadchyi et al., (2023). the necessity of using augmented and virtual reality technologies to improve the organization of group cooperation and teamwork, the education process and increase the motivation of education seekers has been proven.

L. Dashko, & O. Dubytska (2019) revealed the essence of virtual reality when learning a foreign language, and analyzed the positive consequences, types, and ways of using virtual reality technology both in independent work and in the classroom. The means and methods of virtual reality as an informational method of assimilation and presentation of material are shown, and high-tech didactic tools are given that allow to increase the effectiveness of foreign language learning. M. Skurativska, & S. Popadiuk (2019) specified concepts: "virtual language environment" and "virtual educational environment"; modern tools for building a virtual educational environment during foreign language learning, software products in a higher education institution are defined.

As a result of the analysis of the latest research and publications, it was found that there are very few real studies of virtual reality in pedagogy.

The researchers proved the relevance, prospects, and expediency of using virtual reality technologies, showed the advantages and disadvantages of using these technologies in education, analyzed their possibilities in the educational process; analyzed the most common applications based on virtual reality technologies; showed the main stages of the introduction of technologies into the educational process of a higher school.

The presented research significantly enriches the theory and practice of virtual education, but the authors of these works reduce the application of virtual education technologies to the use of electronic textbooks and test shells, less often multimedia materials, and in some cases – computer virtual simulators and simulators. At the same time, many issues related to the widespread introduction of virtual reality technologies in various spheres of life in modern society, including in education, remain unexplored. One of these issues is the need to generalize the accumulated experience of studying the possibilities of using virtual reality technologies in the educational process of a higher school in general and as a necessary component in learning a foreign language, in particular.

The implementation of virtual reality in foreign language teaching is a new aspect in the professional training of specialists. It should be noted that the traditional approaches used for training foreign language specialists in the context of activities teachers are not always appropriate. However, despite this, the implementation of virtual reality in foreign language teaching has not received enough attention. In addition, the relevance of the identified problem is enhanced by a number of contradictions between:

- public order for the training of specialists capable of innovative activities in the educational process, and the insufficient focus of higher education institutions on solving this problem;
- the objective need to train specialists for the implementation of virtual reality and its insufficiently effective implementation in practice in higher education institutions;
- the need to form the readiness of specialists for the implementation of virtual reality and the lack of development of content-methodical support for such training.

Therefore, the objective need to solve the specified problem, its insufficient theoretical and practical development, the need to overcome the specified contradictions determined the choice of the topic of the article.

The aim of the study. To study the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in higher education students' memory, operational characteristics of thinking, and perception in the process of using virtual reality educational programs; to investigate the change of attention, which is closely related to the functioning of cognitive processes.

Methodology

To achieve the defined goal of the research, a set of research methods was applied:

Theoretical: **abstraction** (consists in the mental selection of essential, most essential features, relationships, sides of the object. With its help, an ideal image of reality is formed); **induction and deduction** (define such a mental construction in which a conclusion about some element of a set is made on the basis of knowledge of the general properties of the entire set); **eneralization** (displaying the main results in a general position); with the help of the **interpretation method**, the studied materials were summarized and conclusions were formulated. An analysis of the scientific and pedagogical literature was carried out on the following topics: 1) Virtual reality and learning foreign languages. 2) Memory, thinking, perception and attention in students of higher educational institutions. 3) Research methodologies in education.

Empirical methods. The following data collection methods were used: 1) Visual short-term memory test. 2) Questionnaire for assessment of critical thinking. 3) Likert scale for measuring perception of virtual environment. 4) Tasks on sustained attention and divided attention.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size is 32 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the obtained results, the objectivity of their assessment was ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

The leading idea of the research is based on identifying the features of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, perception in the process of using educational programs of virtual reality, which ensure effective, purposeful formation of professional competence of future specialists in the created innovative educational environment.

Methodological concept of purposeful formation of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, perception in the process of using virtual reality educational programs takes into account the main innovative approaches to the study of the given problem: competence-based, systemic, personally oriented, axiological, activity-based, reflective, humanistic.

The experimental work was devoted to the study of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, and perception in the process of using virtual reality educational programs. The change of attention, which is closely related to the functioning of cognitive processes, was also studied.

The purpose of the experimental study. To determine the degree of influence of virtual reality training programs on short-term visual memory.

Research methods and procedure.

To establish the degree of influence of virtual reality educational programs on short-term visual memory, we have built a system for evaluating the levels of the degree of influence of virtual reality educational programs on short-term visual memory.

The experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, research tasks were determined, a goal was set, an experiment plan was developed, control and experimental groups were selected, their homogeneity was checked, and methods of measurement and processing of results were identified.

The experiment was conducted at the main stage. At the final stage, the results of the experiment were confirmed, their reliability was analyzed, conclusions were drawn about the study of the role and possibilities of virtual reality as a necessary component in learning a foreign language, and the impact of virtual reality educational programs on short-term visual memory.

To assess the homogeneity of control and experimental data, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

We distinguished the levels of impact of virtual reality educational programs on students' short-term visual memory: low, medium, and high.

The conducted experimental study shows that training programs in a virtual environment, which contribute to the formation of students' cognitive motivation, are an effective means of forming thinking, perception, attention, memory, and, in general, education of students of higher education.

Results and discussion

Content of the terminological apparatus of gamification.

The main features of the virtual educational environment. In our time, quickly training specialists in various specialties with the help of virtual reality means creating an ideal learning environment, where mandatory acceptance of the virtual model by those seeking higher education will lead to high-quality and competitive education. M. Smulson (2015) noted that: "Today, the Internet has already gone beyond human control and has become a new reality – virtual".

Nowadays, an integral component of the educational environment is the virtual component, which is a component of learning in the work of study groups, in face-to-face lectures, in the independent work of a student of higher education, in an exam, in the library, etc. (Škerlak et al., 2014).

The system of "virtual reality" was created by replacing the infrared camera with computer images in 1966 by the American computer scientist A. Sutherland, and in 1989 the computer scientist Jaron Lanier introduced the term "virtual reality". In the future, smartphones will become one of the main "accelerators" of virtual reality. Thanks to their use, virtual reality has become widely used not only in such areas as robot management, entertainment, health care, computer games, shops, museums, the automotive industry, military affairs, etc. but also in education (Trach, 2017).

J. Lipeikiene, (2003) defines a virtual educational environment as software that is hosted on a specific server and created to manage various aspects of education: access to resources, monitoring of student performance and evaluation, and course management mechanism.

Let's name the main features of the virtual educational environment:

- password-based access control;
- use of the main types of physical media: virtual reality, animation, digital audio, text, 2D and 3D graphics, digital video;
- creation of well-prepared course material (course material can be updated, changed, supplemented) and its management;
- links to important information on the Internet, digital libraries, etc.;
- communication tools – messengers, e-mail, announcements, presentations, discussions within the environment;
- automatic glossaries, search systems, indexes;
- tools for self-assessment, and automatic assessment;
- connection to the software necessary for training;
- personal space for students of higher education to exchange materials and store them;
- statistical information about the educational process for a teacher of a higher school, monitoring the success of students of higher education, and systematization of their grades.

The virtual educational environment can be called a specific open dynamic space for the implementation of the educational process, an online learning environment, and a necessary component of learning a foreign language (Skurativska & Popadiuk, 2019).

The main advantages of using virtual reality when learning a foreign language.

There are five main advantages of using virtual reality technologies when learning a foreign language:

- visibility (using 3D graphics, it is possible to show educational processes in detail. Virtual reality is able not only to provide information about the phenomenon itself but to demonstrate it with any degree of detail);
- focusing (the virtual world will allow you to fully focus on the material, surround the viewer from all sides for 360 degrees, and prevent you from being distracted by external stimuli);
- involvement (virtual reality allows you to influence the course of the experiment, change scenarios, and solve tasks in an accessible and playful form. During a virtual lesson, you can go on a trip to the countries of the world, and see the world of the past through the eyes of a historical character);
- safety (you can immerse a student of higher education in any situation);
- virtual classes (feeling of your presence in the drawn world, first-person view). This makes it possible to conduct classes in virtual reality (Trach, 2017). Such technologies use very widely computer cognitive graphics, the main task of which is to stimulate creative thinking and cognitive mechanisms, and not just to interpret knowledge.

The use of virtual reality technologies in learning a foreign language implies that the educational space should be rebuilt accordingly.

Formats of using virtual reality in learning a foreign language.

Currently, the following formats of using virtual reality in foreign language learning are distinguished:

– face-to-face learning – transfer of empirical material through virtual reality when learning a foreign language. Virtual technologies in semantic learning offer interesting opportunities for the transfer of empirical material. With this approach, the classic format of the educational space is not distorted, since the lesson is supplemented with an n-minute immersion. The virtual lesson can be divided into several scenes, which are turned on at the right moments. The lecture remains a structural element of the lesson. This makes it possible to consolidate the material, attract students of higher education to the educational space, modernize classes, and visually illustrate;
– distance learning – group classes with social interaction and the effect of presence. With distance learning, the student of higher education is in any part of the world and listens to the language from its native speaker as well as the teacher. Each of them is personally present in the virtual audience, and has his own avatar: he listens to lectures, interacts, and performs group tasks. And therefore, feels the presence, and eliminates the boundaries that exist in education through video conferences;
– mixed education – the opportunity to see what is happening, to be remotely in the classroom while learning a foreign language, to interact with real students of higher education and teachers (the student of higher education can do this remotely if there are circumstances that prevent him from attending classes with the possibility of broadcasting in the mode real-time);
– self-education – any of the developed educational courses can be adapted for independent study. The classes themselves can be stored in online stores (Steam, Google Play Market, Oculus Store, App Store) so that everyone has the opportunity to master or repeat the material independently when learning a foreign language (Trach, 2017).

The best virtual reality projects for learning a foreign language.

Among the best virtual reality projects for learning a foreign language, we should note the following:

– LABSTER – interactive, developed in partnership with leading universities, 3D project – MIT (Massachusetts Institute of Technology), Stanford, and Harvard. Students of higher education can remotely, with a full set of equipment, carry out experiments in scientific laboratories;
– EXPEDITIONS PIONEER PROGRAM – the program allows students of higher education to visit places "where not every person can go." The virtual platform is designed for high-quality learning of a foreign language, within which teachers conduct virtual excursions to strange and exotic places on our planet (the platform has more than 100 educational excursions);
– THE APOLLO 11 VIRTUAL REALITY EXPERIENCE – a loud game that offers to go to the moon on a spaceship. Together with the crew of the historic ship, the authors recreated all the details of the flight, launch, and landing with high accuracy, adding to the study of a foreign language fantastic space landscapes, a documentary chronicle, fantastic music;
– LECTURE VR – the project includes a series of lectures with visual visualization, which can be attended as part of a group and individually as a supplement to the class;
– Colosseum VR – offers higher education students to move to Ancient Rome, to visit the Colosseum, the Palatine Hill, the Temple of Venus, the Arch of Constantine, the center of gladiator fights, the Colossus of Nero, etc.;
– Mezo VR – allows you to see history, trace the stages in the history of civilization, hear an ancient language;
– zSpace – glasses designed for students of higher education function according to the 3D example: who at this moment in the glasses sees the image, students can control the device with the help of an interactive pen (Trach, 2017).

The main modules of the multimedia virtual environment for the study of cultures and languages in institutions of higher education.

In institutions of higher education, the main modules of the multimedia virtual environment for learning cultures and languages are effective and necessary:

- virtual video library – educational video films, films of the countries whose language is being studied;
- virtual media library for learning a foreign language with multimedia courses;
- virtual, with authentic audio materials, sound library;
- satellite television network;
- computer testing system;
- virtual reference system – encyclopedias, dictionaries, grammar guides;
- virtual library of electronic portfolios of higher education applicants;
- a virtual library of electronic manuals (Skurativska & Popadiuk, 2019).

The technology of writing a pedagogical script for a computerized course for designing distance courses for learning a foreign language and building a high-quality virtual language environment.

The application of the technology of writing a pedagogical script for a computerized course to design distance courses for learning a foreign language and building a virtual language environment is of great importance in language learning.

This technology can be presented as follows:

1 stage – exploratory – definition of the purpose and tasks of the course, didactic analysis, analysis of content information from the discipline, methodical analysis, selection of the form of presentation of educational material, selection of techniques and methods of teaching, selection of criteria for mentoring;
2nd stage – main – selection of practical tasks (tests), structuring of reference and educational materials, creation of a bank of game situations, formation of a glossary, development of a testing system (monitoring, current, final, intermediate control, etc.), approbation of the scenario, making changes as necessary;
3rd stage – final – development of instructions for higher education applicants and methodical recommendations for teachers (Skurativska & Popadiuk, 2019).

A modern student of higher education, as well as a teacher of a foreign language, must acquire ICT competence to effectively use the technology of the virtual educational environment in practical activities. The priority is the need to introduce certain information and communication technologies into the educational process, and only then the transition to permanent systematic work with Internet resources (Yatsenko, 2013).

Virtual reality as a necessary component in learning a foreign language.

In the field of foreign language training of the future specialist, mobile learning is extremely important and widespread, i.e. learning using tablets and smartphones. I. Zachepa (2017) emphasizes the need for additional (electronic) products "aimed at more intensive use of mobile devices, i.e. more exercises are offered for independent (autonomous) processing of information for the main types of activities (listening, reading, speaking, writing) and for active communication in a group instead of traditional formalized grammar exercises". Nowadays, when learning a foreign language, preference is also given to the use of manuals that are authentic and provide the presence of online tests, Internet resources, and foreign language exercises (Biletska et al., 2021).

One of the simplest methods of group learning using virtual technologies as necessary components in learning a foreign language is the creation of a group page using the WikiWiki system of rapid hypertext interaction, in the space of a virtual educational environment. This can be a site or blog with links to applications and files. This page is available for all higher education students of the group and all students can discuss, comment, discuss, and leave entries on the forum.

It is effective to use services-systems of social publications and bookmarks (BibSonomy, CiteULike, etc.) to organize the storage of own links to various sources.

SlideBoom and SlideShare services can be used to share and store presentations; and for high-quality work, it is worth working with PDF files – Scribd web service, etc.

Through the online media journal – the Flipboard application, a foreign language teacher can systematize selected various thematic articles (Skurativska & Popadiuk, 2019).

Using virtual reality glasses and helmets as a necessary component in learning a foreign language, students of higher education can immerse themselves in the atmosphere of a curriculum, game, stimulator, etc. Nowadays, the most promising educational direction of using virtual programs is the reproduction of the customs of the country whose language is studied, and directly of its language in the socio-cultural reality, which allows the student of higher education to become a participant in the cultural, linguistic, communicative, socio-cultural situation.

Virtual reality tools provide an opportunity for interactive interaction and have a significant impact on audiovisual perception, which contributes to more effective assimilation of language material. The user feels the reality of the environment precisely with such a virtual presence and in an interactive situation it allows: them to explain, learn to react, and fulfill a conventional role. It helps a lot in consolidating new skills and learning language situations (for example, on the topics: "In the store", "In the theater", "USA", "Great Britain", "Types of transport", "Travel", etc.) – that is, when the developed educational scenario, the reality of which is impossible or difficult to create in the classroom.

Ways of using virtual reality tools.

Education in higher education includes the following methods of using virtual reality tools: conducting seminars, laboratories, lectures, practical classes, organizing educational excursions, etc. Such technology can be used in the process of self-education.

The use of virtual reality as a necessary component in learning a foreign language, as a toolkit in the educational space of a higher school, would allow diversifying the educational process and changing the methods of acquiring knowledge. Modeling the situation when learning a foreign language allows you to explore and study its various options. You can study, consider, and analyze in detail various options proposed by the student himself, and intuitively choose the optimal solution in a specific situation (when various conditions and parameters are changed) or random ones proposed by the education system. A student of higher education can also give a forecast of the expected result by changing and complicating them, check it.

Currently, such content for teaching a foreign language, created in the Google Expeditions application, is sufficient. It is enough to cover the traditional topics that are part of the foreign language curriculum: history, geography, sports, travel, art, etc. We can conclude that since the materials are already available and developed in English, then in the language education system foreign language teachers will be among the first to actively use virtual reality technology (Dashko & Dubytska, 2019).

There are already a significant number of different applications in learning a foreign language for virtual reality, which are constantly increasing. More than 300 companies operate on the European market and have been implementing their technologies in the education sector for a long time (Samsung, Oculus, Sony, HTC, Microsoft). Many of them for learning a foreign language offer services for the development of unique effective programs for institutions of higher education and are engaged in the creation of educational content. Therefore, any institution of higher education can order a special program for learning a foreign language and successfully use it in its educational space (Polishchuk et al., 2022).

Virtual reality as a necessary component in learning a foreign language is the result and process of interaction between students of higher education and teachers, which takes place in a virtual educational space, which cannot exist outside of the communication of participants in the educational process of a higher school (Agüero Corzo & Dávila Morán, 2023). However, virtual educational programs cannot completely replace traditional teaching in higher education institutions, as they only simulate objects in the digital space and reality. However, their wide use in the educational space of higher education is appropriate when studying the most complex topics in learning a foreign language and provides additional opportunities for in-depth learning of the material (Babiuk, 2022).

It is important to note that Esperanza Glasses 3D VR virtual reality glasses are available in university education. With their help, it is possible to immerse yourself in the virtual world with the help of a smartphone. For this it is necessary (Matviienko, 2021):

1) download one of the applications from the Apple Store or Google Play using the keywords VR 3D 360;
2) place a smartphone in a special slot of the glasses;
3) launch the application;
4) insert a smartphone into the helmet.

Virtual reality technologies are a necessary component in learning a foreign language but are not yet widely used. Let's name the following reasons:

- insufficient number of specialists in the field of education who would be prepared to use VR technology;
- unpreparedness for restructuring the education system;
- a high price for VR technology equipment;
- the need to reformat educational plans;
- insufficient number of educational programs (Osadchyi et al., 2023).

The key criteria for training specialists are based on virtual reality.

Modern digital technologies based on virtual reality when learning a foreign language determine the key criteria for the training of specialists, including (Khmelnytska, 2023):

- increasing the concentration of attention of higher education seekers,
- focus on the practical component of the educational space of the higher school,
- facilitating the search for information when learning a foreign language,
- increasing the motivation of those seeking higher education,
- increasing the productivity of the educational process,
- ensuring the interactivity of the educational space,
- monitoring of educational achievements,
- promoting the development of creative abilities, spatial abilities, and memory (Khmil et al., 2023).

Experimental study of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, perception in the process of using virtual reality educational programs.

The experimental work was devoted to the study of the role and possibilities of virtual reality as a necessary component in learning a foreign language; the degree of change in the memory of students of higher education, operational characteristics of thinking, and perception in the process of using virtual reality educational programs. The change of attention, which is closely related to the functioning of cognitive processes, was also studied.

When choosing the results, the role and possibilities of virtual reality as a necessary component in learning a foreign language were investigated; degree of change in memory, operational characteristics of thinking, perception of students of higher education in the process of using educational programs of virtual reality; the change of attention, which is closely related to the functioning of cognitive processes, was investigated.

The purpose of the experimental study. To determine the degree of influence of virtual reality training programs on short-term visual memory.

Research methods and procedure.

To establish the degree of influence of virtual reality educational programs on short-term visual memory, we have built a system for evaluating the levels of the degree of influence of virtual reality educational programs on short-term visual memory.

The experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, research tasks were determined, a goal was set, an experiment plan was developed, control and experimental groups were selected, their homogeneity was checked, and methods of measurement and processing of results were identified.

The experiment was conducted at the main stage. At the final stage, the results of the experiment were confirmed, their reliability was analyzed, conclusions were drawn about the study of the role and possibilities of virtual reality as a necessary component in learning a foreign language, and the impact of virtual reality educational programs on short-term visual memory.

To assess the homogeneity of control and experimental data, statistical processing was carried out using MS Excel and SPSS (Statistical Package for Social Science) programs.

We distinguished the levels of impact of virtual reality educational programs on students' short-term visual memory: low, medium, and high.

Let's take a closer look at all the levels.

Let's list the signs of a low level of influence of virtual reality training programs on short-term visual memory: lack of participation in activities, motivation to study theory; lack of ability to perform the simplest tasks; fragmentary assimilation of knowledge; inability to control, plan one's own work; not being able to conduct introspection.

The formation of the impact of virtual reality training programs on short-term visual memory at an average level: insufficient motivation to study the material; the ability to perform elementary tasks by example; partial assimilation of knowledge, and professional work skills; partial ability to control one's own work, plan its results and conduct self-analysis.

Future specialists with a high level of influence of virtual reality training programs on short-term visual memory show the following indicators: the presence of constant motivation to study the material; high independence in the systematic assimilation of knowledge; the ability to control one's own work, systematically plan, constantly look for ways to improve, show responsibility, carry out introspection.

To study the role and possibilities of virtual reality as a necessary component in learning a foreign language, and the impact of virtual reality educational programs on short-term visual memory, respondents were offered tests for memorizing numerical series, 12 numbers, and 12 images.

After viewing the virtual reality training program for short-term visual memory, the respondents solved the tests again.

Sample: intellectually developed students of higher education or respondents who received higher education (age of respondents 20 – 50 years; number of respondents – 25 people).

Research results: we observe a significant positive impact (at a high level of significance, reliable p – 0.001 ...) that virtual reality training programs have on the volume of 86 short-term visual memory (1.96, this is the difference in mean values). A smaller effect is observed on the symbolic memorization of numbers (0.08, this is the difference in mean values), and on the short-term memory of the respondents (test: length of series, the difference in mean values was 0.28).

We will reveal the obtained results regarding other cognitive processes.

When studying changes in cognitive functions during an experimental study, classical procedures were used for their diagnosis – excluding concepts and establishing similarities with the concept (study of generalizations), proofreading – the Burdon-Anfimov test (measurement of stability and concentration of attention), a modified Schulte digital table (study of switching attention), etc.

Research results. Virtual reality training programs had a significant effect on increasing observability (difference of mean values, 1.4 – difference test); concentration and stability of attention (Bourdon-Anfimov test); on generalization and ability to classify (test of identifying common concepts (establish similarity with the proposed concept sets of five words – 20 sets), exclusion of concepts (sets of 5 words – exclude redundant – 17 sets) (1.8 – difference of mean values). There was a general decrease in indicators for only one of the studied parameters – this (modified Schulte digital table) attention switching: the average time to solve tasks, remaining in the range of the average level of switching, increased to 158.2 seconds from 136.4 seconds. Only one cognitive was used style among personal indicators – field-dependence-field-independence Working in virtual reality training programs (the average solution time decreased to 18.7 seconds from 42.3 seconds) leads to a significant increase in field-independence.

The sample consisted of – 32 respondents.

We claim that the negative impact of virtual reality educational programs is fragmentary and insignificant. In general, virtual reality has a positive stimulating effect on the cognitive processes of the student of higher education and some personal characteristics of a person.

The conducted experimental study shows that training programs in a virtual environment, which contribute to the formation of students' cognitive motivation, are an effective means of forming thinking, perception, attention, memory, and, in general, education of students of higher education.

A comprehensive analysis of the theoretical and methodological foundations of the implementation of virtual reality in foreign language teaching prompts the justification of promising ways to improve virtual reality in foreign language teaching in educational institutions in Ukraine. The recommendations interpreted in the course of scientific research make it possible to use advanced ideas regarding the introduction of virtual reality in foreign language teaching in the conditions of the Ukrainian educational environment.

Recommendations for educational institutions of Ukraine - improving the content of educational programs; improvement of processes of motivation of teachers to independent assimilation of professional knowledge; introduction of innovative forms, methods and technologies of education into the educational process of secondary education institutions; introduction of virtual reality subjects into the curriculum of educational institutions. Inclusion in the work of educational institutions: forms of dissemination of pedagogical innovations, creative groups on virtual reality, etc.

Recommendations for teachers: systematic professional self-development and self-improvement in the conditions of the study of high-ideal achievements in the field of studying virtual reality, as well as the application of new modern technologies and teaching methods; application of innovative methods and information and communication technologies, forms of training organization in professional and teaching practice.

Recommendations for students: encouraging students to research work, to participate in various projects and trainings aimed at familiarization with virtual reality.

Conclusions

We considered the role and possibilities of virtual reality as a necessary component in learning a foreign language, highlighted the main features of the virtual educational environment, and the advantages and formats of using virtual reality in learning a foreign language. The results of our research showed the need for additional theoretical work on understanding virtual reality as a didactic system.

Therefore, we proposed the best practically-oriented virtual reality projects, revealing the content and construction of a virtual language learning environment; the technology of writing a pedagogical scenario of a computerized course for the design of remote foreign language courses is proposed.

The results of the study show the importance of the main modules of the multimedia virtual environment for learning cultures and languages in institutions of higher education; the technology of writing a pedagogical script for a computerized course for designing distance courses for learning a foreign language, building a high-quality virtual language environment is proposed, and methods of using virtual reality tools are presented; the features of the virtual educational environment are defined; the main advantages of using virtual reality while learning a foreign language, formats of using virtual reality in learning a foreign language; the main criteria for the training of specialists are outlined.

In general, the experimental study confirmed that virtual reality significantly affects the educational space of society and the cognitive processes of the individual. This is typical for children, young people, adults, and the elderly. In the article, we offered recommendations (for educational institutions, teachers, students) that lead to the justification of promising ways to improve virtual reality in foreign language teaching in educational institutions in Ukraine.

We see prospects for further research in the development of practically oriented virtual reality projects.

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The role of AI in individualizing learning and creating personalized programs

El papel de la IA en la individualización del aprendizaje y la creación de programas personalizados

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Abstract

This article analyses the technical and methodological aspects of implementing individualised curricula using artificial intelligence in the educational process. The study deals in detail with the issues of technological infrastructure, data collection, and processing, as well as the integration of individualised programmes with existing educational platforms. The methodological aspect of the article includes an analysis of methods for determining the needs and capabilities of each student and the development of a methodology for assessing the success of individualised programmes. The study aims to uncover the potential and benefits associated with the utilization of personalized programs in contemporary education. This is done with the intention of enhancing the overall learning experience and attaining superior outcomes for every individual student and pupil. Future areas of research include further development of technical solutions for individualised programmes, studying

Resumen

Este artículo analiza los aspectos técnicos y metodológicos de la aplicación de programas de estudios individualizados mediante inteligencia artificial en el proceso educativo. El estudio aborda en detalle las cuestiones de infraestructura tecnológica, recopilación y procesamiento de datos, así como la integración de los programas individualizados con las plataformas educativas existentes. El aspecto metodológico del artículo incluye un análisis de los métodos para determinar las necesidades y capacidades de cada estudiante y el desarrollo de una metodología para evaluar el éxito de los programas individualizados. El propósito del estudio es revelar las posibilidades y ventajas de utilizar programas individualizados en la educación moderna para mejorar la calidad del aprendizaje y lograr mejores resultados para cada alumno y estudiante. Entre los futuros campos de investigación figuran el desarrollo de soluciones técnicas para los programas individualizados, el estudio de enfoques metodológicos para adaptar los programas a las

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methodological approaches to adapting programmes to the needs of different categories of student, and developing ethical standards for protecting personal data in education. This article will be useful for teachers, higher education institutions, researchers, and anyone interested in using artificial intelligence to individualise learning and improve education. It offers important discoveries and practical recommendations for implementing individualised programmes in the educational process.

Keywords: individualisation of learning, personalised educational programmes, artificial intelligence, machine learning, data analysis.

necesidades de las distintas categorías de alumnos y el desarrollo de normas éticas para proteger los datos personales en la educación. Este artículo será de utilidad para profesores, centros de enseñanza superior, investigadores y cualquier persona interesada en utilizar la inteligencia artificial para individualizar el aprendizaje y mejorar la educación.

Palabras clave: individualización del aprendizaje, programas educativos personalizados, inteligencia artificial, aprendizaje automático, análisis de datos.

Introduction

The significance of the selected subject arises from the necessity to implement creative methods in the field of education. Due to the constant changes in technology and social requirements, an individual approach to learning is becoming a key element in improving education. Today, most educational systems face the challenge of providing an effective learning process for each student, taking into account their unique needs, learning styles, and pace of learning.

In this context, the use of artificial intelligence (AI) provides an opportunity to transform and individualise this process, taking into account the specific needs and ability level of each student. Machine learning and data analytics technologies allow for the creation of personalised programmes that are adapted to the specific educational goals and needs of students (Chanysheva et al., 2023).

The term "artificial intelligence" or "AI" is commonly used, but it can be very difficult to define and explain to the average person. In the perception presented mainly by cinema and literature, AI takes the form of a fantasy rather than a real understanding of the technological aspects behind the concept. The reality, however, differs significantly from the images that can be found in contemporary cultural discourse (Etzrodt et al., 2022).

For more than eighty years, humanity has come a long way, experiencing mistakes and dead ends in the development of AI, each of which ended in the "winter of AI," accompanied by disappointment in the potential of this technology. But since the early 2010s, the world has been experiencing a "warming" in the field of AI again. That is why large corporations and governments of leading countries are investing billions of dollars in the development of AI, as it is currently transforming every aspect of our lives, from scientific research to everyday things (Alawi, 2023).

The use of AI in the educational process provides an opportunity to individualise learning, which makes education more effective. This means that programmes can adapt to each student's level and learning style by providing them with individualised tasks and materials. It helps to create personalised learning programmes that take into account strengths, weaknesses, interests, and needs. This contributes to improved learning outcomes and learner motivation, as they are more interested in materials that meet their needs (Flindt et al., 2021).

This research has pinpointed various challenges confronting the field of educational science. Primarily, the matter of safeguarding personal data and ensuring privacy becomes paramount, given that the incorporation of artificial intelligence in education involves the gathering and analysis of personal information. It is imperative to delve deeply into ethical concerns associated with the acquisition and utilization of data in educational practices.

It is important to solve the technical and methodological challenges associated with the introduction of AI in education. Developing programmes and infrastructure for individualised learning requires financial and technical resources. In addition, effective methods for evaluating the success and outcomes of such systems need to be developed (Chen et al., 2020).

The research focuses on the role of AI in individualising learning and developing personalised educational programmes. The main aspect of the research is to analyse how AI technologies, in particular machine learning and data analytics, can be used to create individualised learning paths (Kumar Basak, Wotto, & Bélanger, 2018).

It addresses the question of how AI can take into account the unique needs and abilities of each individual by providing personalised tasks, materials, and teaching methods. Significant attention is given to the influence of personalized learning on both academic achievements and motivation, highlighting the potential to enhance the overall quality of education through this methodology (Adiguzel et al., 2023).

Particular attention should be paid to ethical and privacy issues related to the collection and processing of students' personal data in the context of personalised educational programmes. In addition, the study focuses on the technical aspects of introducing AI into the educational process and developing methods for assessing the results and effectiveness of individualised learning (Salnyk et al., 2023).

The aim of the study is to thoroughly analyse and define the role of AI in individualising learning and creating personalised educational programmes. Specifically, the study aims at the following objectives:

1) To consider current trends in education that require individualisation of learning and adaptation of curricula to the needs of students and students.
2) Explore how artificial intelligence technologies, such as ML and data analytics, can be used to create individualised learning approaches.
3) To consider the ethical issues related to the use of artificial intelligence in education and the collection of personal data of pupils and students.
4) To study the technical and methodological aspects of implementing individualised AI applications.

Theoretical framework or literature review

Today, the study of artificial intelligence (AI) is becoming an extremely relevant phenomenon in the field of education. This is due to the challenges that have emerged in society in the context of the integration of information technology into various aspects of our lives. Therefore, basic knowledge of AI is becoming a necessity for everyone. The importance of incorporating AI elements into the educational process is now supported at the state level.

In examining the research conducted by Ryan & Deci (2020), it is crucial to highlight their emphasis on applying the connectivity theory within the framework of contemporary educational settings. This theory, rooted in the concept that knowledge should be easily accessible through networks and online resources, has the potential to create fresh possibilities for students, enhancing both their comprehension and practical application of learning materials. The study by Xie et al. (2022) focuses on the impact of social participation on social inclusion. The researchers carefully analyse the relationship between active participation in social interactions and the level of social integration and conclude that this relationship is important. The article by Chen et al. (2020) emphasises the importance of educational big data for modern education. They thoroughly explore methods for extracting meaning from educational data and analysing it further to develop intelligent educational approaches. The work of Cheng & Tsai (2019) is worth noting as significant in the context of using immersive virtual tours in primary school. The authors thoroughly analyse students' learning experiences and teacher-student interaction when using virtual fields for learning, emphasising their effectiveness in the pedagogical process. Cutumisu & Guo's (2019) study focuses on the use of case study methods to extract students' understanding of computational thinking from their own reflections during programming. The authors demonstrate how this method can be useful for analysing students' understandings and their learning. Daniel (2019) provides a critical analysis of issues related to big data and data science for educational research. The researcher discusses current issues and approaches to the use of big data in education. The study by Gierl & Lai (2018) concerns the use of automatic task generation to create solutions and rationales in a computerised format for formative testing. They highlight methods and approaches to creating such tasks. The researchers also point out the importance of current and future challenges and opportunities in the field of artificial intelligence in education, as well as the prospects for the development of this area. This work provides an important contribution to the understanding and development of the use of artificial intelligence in education. Goksel & Bozkurt (2019) in their book focuses on the role of AI in the educational process. They explore the impact of artificial intelligence on contemporary education, presenting a valuable framework for further exploration in this domain. The researchers' examination of current patterns in the integration of artificial intelligence in education highlights its potential as a crucial element in shaping innovative teaching and assessment methodologies. The study conducted by Hew et al. (2019) prompts a contemplation on the presence of a coherent "theory" within the realm of educational technology research. The authors scrutinize the utilization of conceptual theories in educational technology and assess the existence of well-structured theoretical frameworks. In a study by Huang et al. (2020), the focus shifts towards the prediction of students' academic performance using extensive educational data and the analysis of learning activities. The authors assess various approaches for classifying and scrutinizing learning logs with the aim of forecasting academic achievements.

Insufficiently explored aspects within the realm of educational technology and the utilization of big data encompass several crucial facets demanding increased attention and investigation. Among these, there is a need for the formulation of conceptual and theoretical frameworks to enhance comprehension and elucidation of the impact of big data on learning and education. Existing theoretical approaches, thus far, exhibit limitations and warrant further refinement. Another area that remains under-researched pertains to the ethical considerations surrounding the use of big data in education. Specifically, it is imperative to address issues related to the confidentiality and privacy of student data while establishing ethical parameters governing the collection and utilization of educational data. This is particularly relevant in the context of the growing amount of information collected and processed in educational systems.

Methodology

The research methods used contributed to solving the tasks set by the authors, including analysing the essence of the use of AI in education, which defines the standards in the field of education and science, identifying the main areas of its application, and identifying the problems of implementing AI in the educational environment. The research was conducted using the dialectical method, which was used to analyse AI on both a general and practical basis. This method helps to resolve the issue of the concept of using AI to build individual learning paths, as it contributes to the development of scientific knowledge by moving from concrete to abstract aspects of the problem, abstracting from details. This phase holds considerable importance in the generation of novel scientific insights, achievable through the examination of problem elements and the identification of emerging patterns through abstraction from specific details.

Data from open sources were used to study the dynamics of academic performance. They were obtained through publicly available information resources, such as websites of educational institutions, national education databases, or other documents and reports that are regularly published. In particular, the data on academic performance included average student grades for the 2021/2022 academic year, the dynamics of changes in these grades, as well as other indicators that reflect the qualitative and quantitative aspects of academic performance. The results were evaluated using standard methods of mathematical statistics. The results of the analysis were interpreted with reference to the specific objectives of the study, which allowed us to draw conclusions about the impact of AI on individual learning trajectories and identify possible difficulties in their implementation.

Results and discussion

Today, there are trends in the educational process that require individualisation of learning and adaptation of curricula to the needs of students and pupils. One of them is diversity in learning styles and pace. Each consumer of educational services is unique, and it is important to create curricula that take into account their individual needs and capabilities. This requires appropriate strategies for adaptation and personalisation of learning (Rakhimov, & Mukhamediev, 2022).

Another trend is the growing role of technology in learning. The Internet, mobile applications, and other innovative tools allow for individual learning paths and approaches. Pupils and students can access a variety of learning resources with convenience and efficiency. It is important to take into account the diversity of cultures and languages of popular educational programmes that are freely available online. Globalisation and intercultural interaction create a need to develop intercultural learning and include multilingual pupils and students in educational processes.

In addition, the role of lifelong learning is growing. Rapidly changing technologies and economic realities require continuous learning and retraining. Curricula need to be flexible and individualised to meet these challenges. Contemporary developments in the field of education emphasize the necessity for personalizing learning experiences and adjusting curricula to enhance the efficiency and advancement of the educational process. Table 1 shows the main trends in the development of modern education.

Table 1.
The main trends in the development of modern education

Education trend	Contents of the main provisions
Individualisation of learning	Contemporary education aims to develop curricula and methodologies that consider the unique requirements of students and their learning speeds. This fosters enhanced and more efficient learning experiences.
Use of technology	The role of technology in learning is growing. The Internet, mobile applications, and online resources allow access to learning from anywhere and at any time.
Intercultural learning	Globalisation creates a need for intercultural learning and the inclusion of different cultures and languages in the educational process. Such approaches promote understanding and respect for diversity.
Lifelong learning	Rapid changes in technology and economic conditions create a need for continuous learning and retraining. Educational programmes are becoming more flexible and accessible throughout life.

Source: Created by the authors based on Ali (2022).

This table provides information on the key trends in modern education and helps to understand how the educational process is adapting to modern challenges. Based on the above, it can be stated that these trends have a significant impact on the requirements for the implementation of AI. Individualised learning implies the unique needs of each student, and in this context, AI can be used to adapt curricula and approaches to meet these needs.

AI is now playing a key role in creating individualised educational trajectories for each pupil and student. It can analyse and process large amounts of data, taking into account individual needs and abilities (Razaulla et al., 2022). By analysing data on learning progress, learning style, pace of learning, and other parameters, AI can recommend personalised learning materials and tasks that meet specific needs. With the help of specialised AI systems, individualised curricula can be created, taking into account the strengths and weaknesses of students, their goals, and interests. Teachers and educators are provided with tools to create unique curricula that help develop individual skills and learning achievements for each student. AI can also provide continuous monitoring of learning progress and adapt programmes in real-time. This helps to avoid pupils and students falling behind or being overwhelmed, ensuring an optimal learning trajectory for each (Luan et al., 2020).

Individualizing the education of pupils and students involves developing distinctive learning methods that consider the unique attributes of each learner. Tasks related to individualization encompass crafting personalized learning plans that consider the strengths, weaknesses, interests, and objectives of students. Additionally, this process involves tracking the progress of learning and adjusting the curriculum as needed (Hendradi et al., 2020).

Individualized instruction empowers educators and educational establishments to more effectively address the requirements of pupils and students, fostering their educational and developmental achievements. It facilitates enhanced and cooperative learning, encourages personal growth, and unleashes the unique potential within each person/

Advancements in technology, exemplified by the utilization of online resources and mobile applications, have facilitated the enhancement of accessibility and interactivity in learning. AI is a pivotal element in this progression. The increasing global intercultural engagement necessitates strategies that acknowledge cultural diversity, and AI emerges as a valuable tool for translating and customizing learning materials to accommodate these diverse cultural contexts. Due to the need for lifelong learning, AI can become an important tool for providing individualised educational opportunities at different stages of personal development.

AI technologies, such as machine learning and data analytics, can be used to create individualised learning approaches due to their ability to analyse large amounts of information and highlight the unique personal characteristics of each student. Machine learning allows special education systems to learn from accumulated data and develop models that predict which learning approaches work best for each student (Bahri, & Lestari, 2021).

By analysing the data, you can identify the advantages and disadvantages of its users, their individual learning style, the speed of learning, and other parameters necessary to create a favourable learning environment. Based on this data, you can create personalised learning plans that take into account the specific needs and goals of each student.

Learning recommender systems (LRSs) are important tools in the education sector that use machine learning technologies to provide individualised recommendations for learning materials and learning approaches. Their purpose is to enhance the learning experience and enhance the overall quality of education while promoting a more effective utilization of educational resources. The operation of Learning Data Centers (LDCs) relies on analyzing extensive data, including students' learning records, responses to assignments, past advancements, and various parameters. Machine learning allows LDCs to create individualised profiles for each student and anticipate their learning needs (Adjerid & Kelley, 2018). One of the key functions of an LDC is to recommend learning materials that best meet a student's specific needs and goals. For example, the system can recommend specific courses, textbooks, video lectures, or assignments that will help a student improve their knowledge and skills. In addition, LDCs can serve to monitor learning progress and provide students and teachers with information about achievements and possible areas of improvement. They help to create more effective curricula and provide the opportunity to individually tailor learning to the needs of each student and learner (Türkmen, 2023). Table 2 shows the recommendation systems of the main popular MOOC accelerators.

Table 2.
Recommendation systems of the main popular MOOC accelerators

System	Functionality	Paid/free of charge
Coursera	Coursera uses colourimetry algorithms to recommend courses that are similar to courses that the user has already viewed. For example, if a user is watching a course on programming, they may be recommended other courses on programming. Coursera also uses filter-based algorithms to recommend courses that match the user's interests. For example, a user who is interested in machine learning can be recommended courses about machine learning.	Free, paid
edX	edX uses algorithms based on filters to recommend courses that match the user's interests. For example, a user who is interested in business may receive recommendations for courses about business. edX also uses ratings-based algorithms to recommend courses that are highly rated by other users.	Free, paid
Udemy	Udemy uses rating-based algorithms to recommend courses that are highly rated by other users. For example, if a user rates a course highly, they may be recommended other courses that are also highly rated by other users. Udemy also uses algorithms based on user feedback to recommend courses that users are likely to find useful.	Free, paid
LinkedIn Learning	LinkedIn Learning uses algorithms based on career data to recommend courses that may be useful to a user in their professional development. For example, if a user works in the IT industry, they may be recommended courses about IT.	Paid
Khan Academy	Khan Academy uses algorithms based on the user's browsing history to recommend courses that may be useful to the user in their learning process. For example, if a user watches a course on mathematics	Free of charge
YouTube	YouTube uses algorithms based on a user's browsing history to recommend videos that may be of interest to the user. For example, if a user watches a video about programming, other videos about programming may be recommended. YouTube also uses algorithms based on user feedback to recommend videos that users are likely to find useful.	Free of charge
TED-Ed	TED-Ed uses algorithms based on user feedback to recommend videos that users are likely to find useful. For example, if a user rates a video highly, they may be recommended other videos that are also highly rated by other users.	Free of charge

Source: Created by the authors based on Aldowah, Al-Samarraie & Fauzy (2019).

Learning recommender systems have a number of benefits. They can help users find courses that match their preferences and needs. They can also help save time and resources by recommending courses that are likely to be useful. However, learning recommender systems are not without their drawbacks. They may not be as accurate because they are based on data about users' past activity. There is also the possibility of bias, as recommendations may take into account the interests of the majority rather than the individual user (Abed Ibrahim & Fekete, 2019).

These technologies also allow for real-time monitoring of learning progress and adaptation of curricula to meet the needs of each student. They help to create opportunities for more effective and individualised learning, contributing to the success of each student.

When considering the ethical aspects of using AI in education and collecting personal data of students and learners, it becomes clear that there is a need to pay special attention to this issue. On the one hand, the use of AI can greatly facilitate learning by creating individualised learning trajectories and recommendations, but on the other hand, it raises questions about privacy and personal data protection. When AI is used to analyse learning progress, systems often have access to various types of personal information, including academic achievement, learning style, and even emotional state (Niemi, Manhica, Gunnarsson, Stahle, & Larsson, 2019). As a result, this raises questions about who has access to this data and how it will be used. It is also important to consider the bias and relevance of the recommendations provided by the AI. If the system is based on other users' data, it may result in recommendations that take into account the interests of the majority rather than the individual needs of each pupil or student (Alzain, 2019).

When considering the technical aspects of implementing personalised programmes using AI in education, it is important to examine the technological infrastructure. This includes researching the available platforms, software, and hardware that can be used to create and run personalised learning programmes. Technical aspects also include data collection and processing. Effective personalised learning requires the collection and analysis of a large amount of data about each learner or student. The study should include an analysis of how this data is collected and stored, as well as its security and privacy.

They require consideration of how to integrate personalised programmes with existing educational platforms and systems. How do these new solutions interact with other components of education, and how can individualised programmes be made to work seamlessly within the wider context of learning? Analysing the technical aspects of implementing individualised learning programmes using artificial intelligence requires studying the technological capabilities, data collection and processing tools, and integration aspects for the effective implementation of these programmes in the educational sphere.

This study has practical and theoretical implications that are important for the further development of education and the use of technology in learning. Practical implications include the possibility of creating and implementing individualised curricula that can adapt to the needs of each pupil or student. This can improve the quality of learning and ensure greater student success in the learning process. Practical implications also include the identification of optimal technical solutions for the implementation of individualised programmes, which will help educational institutions and teachers find the most effective ways to apply artificial intelligence. The theoretical implications are to broaden the understanding of how AI technologies can be used in education. This helps to improve theoretical models of learning and develop new approaches to individualised learning. Also, this research can contribute to the development of ethical standards and policies for the protection of personal data in education, which is of important theoretical importance.

Conclusions

This study has thoroughly analysed the technical and methodological aspects of implementing individualised learning programmes using AI in the educational process. The findings emphasise the importance and potential of such programmes for the further development of education.

The study's technical dimensions suggest that existing technologies and platforms provide the capability to develop personalized programs customized to the requirements of every student. It is crucial to investigate how these technical solutions can be integrated into the educational process and assess their compatibility with established MOOCs.

Methodological considerations highlight the importance of examining how to recognize the requirements and capabilities of each learner, as well as developing a methodology to assess the effectiveness of personalized programs. Taking into account different learning approaches, age, and individual characteristics of each student, it is important to develop a methodology that would help achieve the best results. From a practical perspective, the introduction of individualised learning programmes using AI can improve the quality of learning and help each student achieve greater academic success. However, it is also important to consider ethical issues and protect users' personal data.

The study found that individualised programmes create more incentives for students through a personalised approach to learning. The introduction of such programmes can help increase students' motivation and engagement in learning. It is noted that individualised programmes allow more accurate consideration of individual needs and level of learning for each student. Attention is focused on the fact that individualised programmes allow students to receive personalised support according to their specific challenges and strengths. This can lead to more effective training and skill development. Overall, the study emphasises the importance of individualised programmes in modern education and points to the potential of artificial intelligence to achieve this goal. Taking into account technical and methodological aspects, effective individualised curricula can be developed that meet the needs of each pupil and student.

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Web-based applications in higher education: revolutionising language learning in the digital age

Aplicaciones basadas en la web en la educación superior: Revolucionando el aprendizaje de idiomas en la era digital

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Abstract

This research article aimed to examine the utilisation of web applications in higher education, specifically focusing on their presentation and usage. Methodology: a mixed approach was used in the study. The results showed that by analysing how these applications are used and discussing user perspectives, the study shed light on the interplay between technical functionality and social engagement in information and communication technologies. Students in higher education view educational web applications as supplementary resources, utilising them for tasks such as translation and pronunciation practice. It can be concluded that the active and productive use of educational mobile applications by students in Ukraine has notably increased, particularly in the context of war. The key benefits reported by students

Resumen

Este artículo de investigación tuvo como objetivo examinar la utilización de aplicaciones web en la educación superior, enfocándose específicamente en su presentación y uso. Metodología: se utilizó un enfoque mixto en el estudio. Los resultados mostraron que al analizar cómo se utilizan estas aplicaciones y discutir las perspectivas de los usuarios, el estudio arrojó luz sobre la interacción entre la funcionalidad técnica y la participación social en tecnologías de la información y la comunicación. Los estudiantes de educación superior ven las aplicaciones educativas web como recursos complementarios, utilizándolas para tareas como prácticas de traducción y pronunciación. Se puede concluir que el uso activo y productivo de aplicaciones educativas móviles por parte de los estudiantes en Ucrania ha aumentado notablemente, especialmente en el

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included the accessibility and convenience of web-based educational tools. These applications serve as both learning aids and motivational tools, addressing challenges such as remote learning and limited English-language materials. The widespread use of web applications during times of war has proven instrumental in maintaining educational access and quality in Ukraine.

Keywords: application, user, technical and social aspect, information and communication technologies, social and learning context.

contexto de la guerra. Los beneficios clave reportados por los estudiantes incluyeron la accesibilidad y conveniencia de las herramientas educativas basadas en la web. Estas aplicaciones sirven tanto como ayudas de aprendizaje como herramientas motivacionales, abordando desafíos como el aprendizaje remoto y la disponibilidad limitada de materiales en inglés. El uso generalizado de aplicaciones web durante épocas de guerra ha demostrado ser fundamental para mantener el acceso y la calidad educativa en Ucrania.

Palabras clave: aplicación, usuario, aspecto técnico y social, tecnologías de la información y comunicación, contexto social y educativo.

Introduction

The spread of information and communication technologies (ICTs) in higher education has led to significant transformations. The aim of ICT in higher education has been to improve the outcomes and performance of teachers and students (Muftah, 2023). The popularity of web-based applications lies in the fact that they can be accessed via smartphones, hence the growing number of users. While information and communication technologies play an important role in learning, it is still common to see that the mobile devices through which students use web applications are subject to prejudice from certain members of the education system (Gonçalves et al., 2022). Although new education is actively introducing ICTs into learning, with mobile devices as the main tool, the internal rules and regulations of some educational institutions are very unfavourable for the effective implementation of digital technologies. These institutions are characterised by an environment where the carrying and use of mobile phones is prohibited (Chen et al., 2019). However, in relation to higher education institutions and among students, there is an active use of applications such as Learning English and Duo linguo, Tubidy MP3 Music, and Videmate outside the classroom on smartphones (Garvasiuk & Namestiuk, 2022). From this perspective, the problematic of the presented work is the question of how students learn English in their own cultural context and how they use web applications?

Web-based applications in the context of higher education have indeed changed and transformed the way foreign languages are learnt in the digital age. Traditional approaches to language learning, such as classroom or one-to-one tuition, are still important, but new technologies provide students with more opportunities for self-directed learning and language practice. In addition, in the context of the war in Ukraine, active hostilities, shelling, and military operations have damaged and destroyed infrastructures, including schools and universities (Sherman et al., 2022). Most of the affected institutions (both public and private) were left without basic educational tools and staff. Libraries and laboratories in most of these universities have also been destroyed. So, what can be done to improve the level of foreign language teaching and learning in a time of war? In light of this question, two working hypotheses have been put forward: the use of web-based applications is a lifesaver for Ukrainian education in times of war; the use of web-based applications is linked to the social, cultural, and technological context of higher education institutions and students.

In this context a specific research question were proposed: How do students in Ukrainian higher education institutions utilise web-based applications for learning English in the context of the ongoing war in Ukraine?

Theoretical framework or literature review

Despite the valuable insights provided by previous studies on the impact of web-based applications in language learning, there are several limitations that need to be addressed. Firstly, the methodology used in some described studies are limited in scope and not clearly defined how web-based applications impact language learning. Thus, one of the main ways that web-based applications impact language learning is through access to a variety of online resources and self-study programmes. Students can use these resources to learn grammar, words, and phrases, as well as to gain skills in pronunciation and comprehension. Web-based applications also provide opportunities to interact with other students and teachers from different countries, which helps to develop language skills and cultural understanding. The generalisability of results from previous studies are limited due to the specific contexts in which they were conducted. Factors such as the cultural background of participants, the language being studied, and the specific web-based applications being used restricted the results and limited their applicability to different settings. So, in order to develop the presented research approach, the paper focuses on theories of representation, on the one hand, and theoretical models that study the social integration of web applications and (mobile) technical devices in education, on the other. According to Maciej (2023), three theoretical models shed light on the social "attachment" of society to technical devices: the diffusion model, the broadcast model, and the circulation model. To these three models, we should add the sociology of use, which we consider indispensable, especially in the context of the war in Ukraine.

Social studies of ICT use have gone through a series of assessments and perspectives, partly updated by the emergence of modern digital media (mobile internet, social networks, mobile applications, etc.). Weber, Dettmer, Schurz & Thelen (2022) describe the contributions and limitations of sociological approaches to ICT use in education.

Studies conducted within the sociological perspective reveal gaps between the use envisaged by the creators of a sociotechnical device and the actual use by users (Dahal, 2022). Related research analyses the relationship between technical innovation and social innovation, the interaction between humans and technology (Vandebroeck, 2022). The author takes into account both social and technical use of information and communication technologies.

For many years, scholars have been trying to comprehend the diversity of processes associated with the social appropriation of ICTs, while avoiding any critical logic. Without fitting into any of the different models, we consider the circulation model to be appropriate and important for studying how students represent themselves and use educational mobile and web-based applications for learning a foreign language. Legemaate, Grol, Huisman, Oolbekkink-Marchand & Nieuwenhuis (2022) appeal to the notion of a socio-technical frame of reference, which is defined as the union of a framework of functioning and a framework of use. For the authors, the central question is how does it work and how is it used?

According to Rosa, Villanueva, Miguel & Quinto (2022), a technical device cannot be studied and understood separately from the social context in which it is integrated. Ultimately, the socio-technical approach to technical devices simultaneously encompasses four dimensions: the structural characteristics of platforms, user use, and the trajectory and functions of the device itself (Krymets, 2022).

The notion of cognitive, individual, and collective representations plays a crucial role in the design, acceptance, or rejection of a sociotechnical device. Indeed, the idea of social representations is a way of interpreting the world and everyday reality in the form of social knowledge, which an individual constructs more or less consciously based on subjective considerations (Dobrovolska et al., 2021).

In his work, Sofilkanych (2022) demonstrates the two processes that make up social representations: objectification and attachment. Objectification is based on cultural and normative criteria. The attachment is related to the institution. The objectification itself is formed in such a way that it makes it possible to appropriate and integrate knowledge about a particular subject. For students, objectification is a tried-and-tested activity, as they a priori belong to cultural groups and are exposed to institutional norms and standards during their studies. As for attachment, it encompasses the incorporation and social rooting of representation in the subject's value system (Jalilbayli, 2022a).

In the research presented here, objectification involves the examination of cultural and normative criteria, while embedding highlights the way in which educational web or mobile applications are given meaning on an individual level. In this respect, the processes described are inextricably linked to mediation.

The concept of mediation is more complex than one might imagine. It goes beyond everyday exchanges of information (Afrilyasanti, Basthomi & Zen, 2022). The act of mediation necessarily encompasses the following three dimensions: technical substrate (what devices?), political and professional procedures (which actors, which professions), and cultural and social meaning (what values, what principles?).

As for the term “web-based learning device”, it is considered in this paper as a technical set of practices, a way of thinking (habitus) that facilitates learning (Damayanto et al., 2022). The digital mediation of web-based devices rather focuses on a process that results in learning, but also in the dissemination of knowledge. It is also seen as a means of mobilising and responding to the cognitive needs of any society, taking into account the social and cultural factors of that society (Jalilbayli, 2022b).

The digital knowledge mediation approach raises the issue of the loss of individual autonomy. Therefore, the approach involves going beyond the mere transfer of information and considering the way in which links are made between information needs and information use in the transformation of information into knowledge (Puebla et al., 2022).

Despite the fact that the introduction and use of web and mobile applications in foreign language learning is part of the usage, they have received very little attention in the educational environment. Among students, digital educational applications are perceived as mere learning tools rather than as hypothetical mainstream learning tool. This indicates that digital learning cannot automatically “win” over traditional learning (Jie & Sunze, 2023).

The use of technology in non-educational environments offers opportunities for language learning in different situations (Alrikabi et al., 2022). A study conducted by Alenezi (2023) on students' perceptions of web-based applications showed that the use of technology affects the quality of learning. Learning seems to be more interesting and creative. This is particularly true of mobile technologies, which provide portability, social interactivity, individuality, sensitivity, and contextual connectivity (Martín-Sómer et al., 2021). It is visible that the lack of attention to the potential loss of individual autonomy in the digital knowledge mediation approach is a critical limitation. Understanding how technology can empower learners while also recognising the risks of dependence on digital tools is essential for effective language learning strategies. While previous research has laid a foundation for understanding the impact of web-based applications in language learning, there is a need for more comprehensive and interdisciplinary study that addresses the limitations mentioned above. By addressing these limitations, it is possible providing a more nuanced and holistic understanding of how web-based applications can enhance language learning outcomes.

Consequently, a review of the scientific literature on the use of web-based applications for foreign language learning suggests that there is a relationship between the growing use of portable devices such as smartphones, MP3 players, and personal digital assistants. The next finding relates to the importance of web-based applications in foreign language learning. It is not only about the ubiquitous nature of learning but also about the various functionalities of the software, such as automatic speech recognition and mobile social networks. The third and final aspect concerns the attributes of the technical device. This is how we see the use of a foreign language learning app. Students report improved language proficiency, especially in vocabulary, reading, writing, grammar, and translation exercises, thanks to the use of web-based applications on mobile devices.

In summary, the review of previous studies highlights the impact of web-based applications on language learning, focusing on access to online resources, interaction with other students and teachers, and cultural understanding. However, limitations in methodology and generalisability of results suggest the need for a more comprehensive and interdisciplinary approach. The current study aims to address these limitations by focusing on the socio-technical framework and social representations of web-based applications in language learning. By integrating theories of representation and models of technology use in education, the study seeks to enhance understanding of how students engage with and benefit from web-based language learning applications. Ultimately, the study aims to contribute to the broader conversation on the role of technology in language learning and explore the potential for empowering learners while also recognizing the risks of dependence on digital tools. Through a nuanced and holistic examination of the impact of web-based applications, the current study aims to provide valuable insights for improving language learning outcomes and informing future research in the field.

Methodology

The study used a mixed approach that combined quantitative and qualitative methods. Data triangulation, a key aspect of the mixed approach, allowed diverse perspectives on the study topic to be gathered and increased the reliability and validity of the findings.

A survey was conducted among 150 English students from National Polissia and National VO Sukhomlynskyi Mykolaiv universities between September 7 and December 30, 2023. The questionnaire, which contained closed and open questions, was distributed online and focused on perceptions and use of web applications on smartphones.

In-depth interviews were conducted with 20 students selected through purposive sampling. This method was used to ensure that participants had experience using digital educational web applications for English language learning. The interviews were based on mutual trust and were recorded for later transcription and analysis.

To minimize bias in participant selection, specific criteria were defined. Participants had to be English learners who:

They regularly used digital educational web applications.

They had experience with different types of digital educational web applications.

They were willing to share their experiences and opinions on using web applications.

The interviews were transcribed and managed using Advene software, and lexical and semantic analysis was performed using NooJ software. The survey data were analyzed using descriptive statistical techniques.

Limitations of the study

It is important to note that the sample size in this study was relatively small, with only 150 students participating in the questionnaire survey and 20 students participating in the in-depth interviews. This limited sample size may affect the generalizability of the findings to a larger population.

Additionally, the use of purposive sampling may introduce bias into the study, as participants were selected based on specific criteria.

Analysis of data

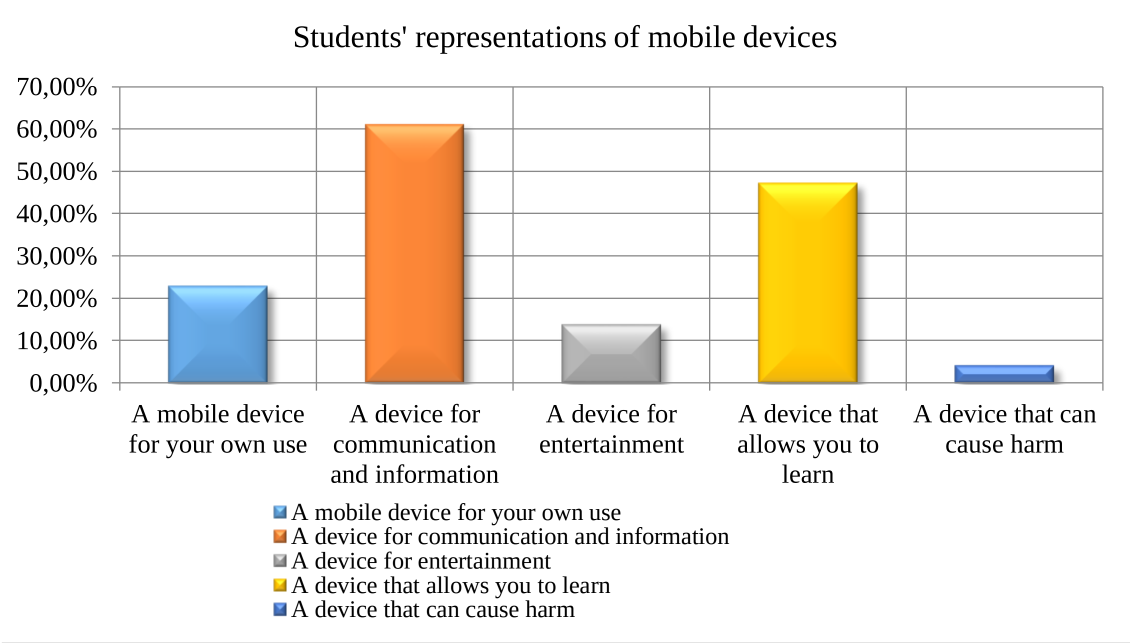
Analysis of the survey data was carried out using descriptive statistical techniques, such as frequency of responses, mean, median and standard deviation. Data from the in-depth interviews were analyzed using a content analysis approach, which allowed for the identification and understanding of emerging themes and patterns in participants' responses.

**Overall, the mixed methodology used in this study provided valuable information about the perceptions and use of web applications in learning

Results and discussion

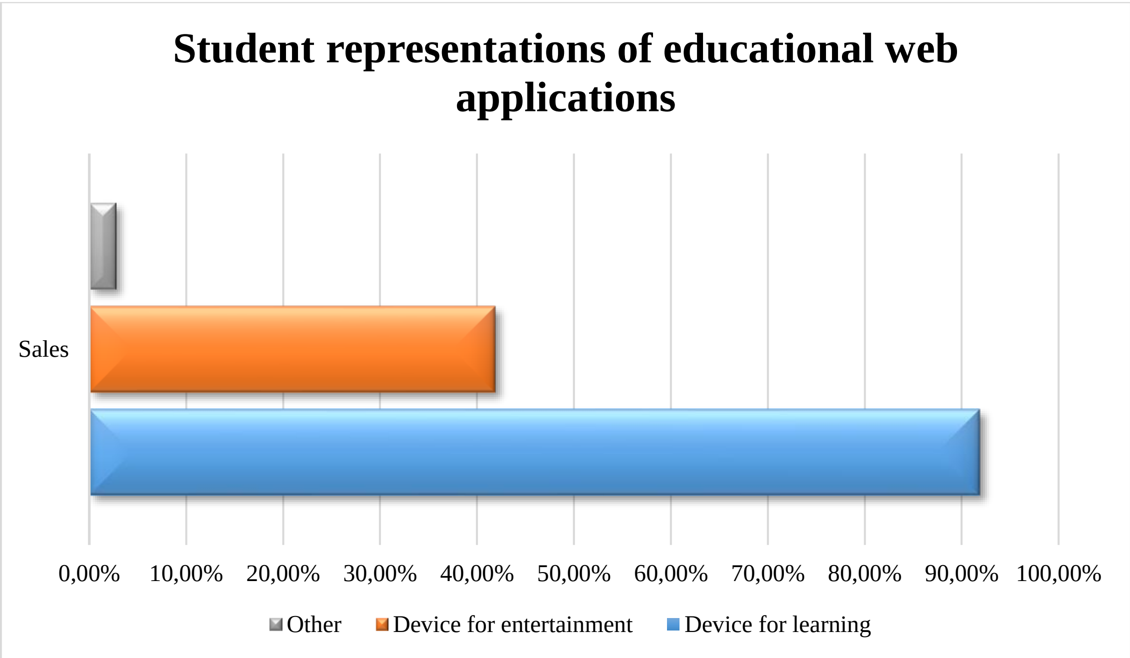
The main results of the presented work, which directly relate to the working hypotheses of the study, indicate that the use of web-based applications by students in higher education for learning foreign languages is not a natural phenomenon, but is socially constructed and that it is related to the social, cultural and technological context of the studied higher education institutions.

For 61% of students, a mobile device is an information and communication device. For 47% of students, it is a device for academic learning (Fig. 1):



Source : author's own development

For 91.9% of students, educational web applications are a learning tool. At the same time, for 41.9% of students, the use of educational web applications was motivated by learning and educational realities (mainly distance learning, lack of documents in English, most teachers teach the material in digital format) (Fig. 2):



Source : author's own development.

According to students' responses, the two most widely used educational mobile apps are Duolingo (34.7%) and LingApp (26.6%). The majority of students (48%) have been using educational mobile web applications for two years or more. 35.2% of them used educational mobile educational mobile web applications for the first time.

For most students, the main activity they perform in educational mobile web applications is translation (46%). It should be noted that pronunciation/phonetics comes in second place.

The study shows that in many ways, students - whether they are regular users or not - have formed social representations of mobile web applications that include a sense of identity and capabilities that are likely to facilitate and help their English language learning. For example, most students said that “it is easy to practice English even at home” (students 8, 13, 18), while others stated that “the mobile web app helps to express themselves more easily and corrects mistakes” (student 18).

The theoretical framework allowed us to identify social representations and their influence on the pedagogical integration of web applications in higher education.

For the students surveyed, educational mobile applications are primarily a learning tool.

In their opinion, educational web applications refer to the idea of access. Only one student noted that “web applications are useful because you can study even if you don't have the money to buy a textbook or dictionaries” (student 13). Another added that: “It's like a second teacher because it helps to deepen our knowledge” (student 1).

Finally, it is worth commenting on the lexical and semantic field of words used by the students in relation to the term 'web application': (course, important, deepen, and knowledge). In this context (student 7) noted: “The educational web application allows me to deepen my knowledge of English and to understand words or expressions that I did not understand”. Similarly, “It is useful in the sense that it helps us to better understand a number of concepts that we were not aware of before. It also makes it easy for us to study because we always have our phone with the web application at hand” (student 12).

The following table clearly demonstrates the lexical and semantic meaning of "educational web application" for the focus group (Table 1):

Table 1.
Lexical and semantic meaning of the concept “educational web application”

Nouns	Adjectives	Verbs
Help	Important	Deepen
Access	Light	Understand
Course		
Knowledge		

Source : authors' own development

The first factor that motivates the use of educational web applications is related to educational realities. According to Achkan, V. V., Vlasenko, K. V., Lovianova, I., Rovenska, O. H., Sitak, I. V., Chumak, O. O., Semerikov, S., (2022), modern education requires students to be more actively involved in the learning process, to be independent, and to be creative in solving problems. Web-based applications provide an opportunity to develop these skills, help to acquire new knowledge and skills, support them in the learning process, and contribute to its effective assimilation. In the same context, Iyamuremye, Mukiza, Nsabayezu, Ukobizaba, & Ndihokubwayo (2021) note that educational web applications provide access to a wide range of diverse learning material that can be used for self-directed learning and knowledge improvement. They make learning more interesting and engage students in active forms of work, such as completing tasks, playing games, interacting with peers and teachers in a virtual environment. Also, the use of educational web applications increases the accessibility of education, especially for those students who are unable to attend traditional educational institutions and study remotely due to active hostilities (Kozlova & Polyezhayev, 2022). They allow for education anywhere and anytime, providing flexible conditions for learning and development.

In a related qualitative study, Hinze, Vanderschantz, Timpany, Cunningham, Saravani & Wilkinson (2023) highlighted the idea that educational web applications stimulate motivation to learn, facilitate access to learning resources, and provide an interactive and effective form of learning. They are an integral part of the educational process in the modern world and meet the needs of modern education. It should also be added that the individual presentation of the surveyed students also turned out to be social, as most students were told about web applications by their friends: “All students use these applications, so I wanted to try it myself, and I have been using them ever since" (student 6). In this context, the topic of personal involvement of the student should also be touched upon, as evidenced by the expressions "myself" and "curiosity": "I myself had problems with some of the English exercises, being curious by nature, I went to the opera and found learning English easy" (student 1).

In a similar study, Bashori, van Hout, Strik & Cucchiarini (2022) emphasise the role of social and academic context in the use of educational web applications.

Students in Ukraine use educational web applications as "facilitating" educational resources in the context of higher education. They regularly use them even before entering higher education. Only 20.8% of them use applications very rarely. According to the category of students who use web applications frequently, they are influenced by the social context consisting of other students, and above all their friends who are already regular and regular users, they actively translate texts and practice pronunciation/phonetics.

The use of educational mobile applications by students in higher education institutions in Ukraine is a completely constructed fact. In fact, the realities of war have greatly contributed to the use of educational web applications for learning a foreign language. Some of the main advantages of using educational web applications for students in higher education institutions in Ukraine include accessibility and convenience. Most students own smartphones, so they can easily download educational web applications to their devices and access learning material anytime and anywhere.

Web-based educational applications also provide students with the opportunity to learn material at their own pace. They can repeat material that they find difficult to understand or move faster through material they have already mastered (Tabassum et al., 2022). This allows students to tailor their learning to their individual needs and enables more effective learning. In his study, Kharitonenko (2022) concludes that web-based educational applications can be interactive, allowing students to complete exercises and tests, receive instant feedback, and check their progress. This promotes active participation of students in their own learning process and helps them to learn more effectively.

Thus, these factors make educational web applications popular among students in higher education institutions in Ukraine. They have become essential tools to support student learning and development, and their importance and use may continue to grow in the future.

Conclusions

This study aimed to explore Ukrainian students' perceptions of web-based educational applications and how they utilise them in the context of higher education, particularly considering the impact of contextual factors such as the effects of war and the prevalence of smartphones. The deployment of information and communication technologies (ICTs) in higher education in Ukraine has undoubtedly generated excitement among all social strata, especially students. Web-based applications have made it possible to show that there is another opportunity in education that aims to help and assist students in their quest for knowledge and learning. These web-based applications used in education remain an indispensable means of promoting integration into the digital society.

Today, the topic of ICT and digital representations remains open for discussion and polemics in the Ukrainian context. So is the use of educational web applications. This is all the more true as it is reinforced by the place, context, and technical device used for information and communication, i.e. the choice of a smartphone (which is cheaper and easily accessible to everyone) as opposed to a computer. Ukrainian students' perceptions of web-based applications are related to contextual factors, in particular, the effects of war. Faced with these realities, students use educational web applications as a means of facilitating their learning. There are uses for translation, pronunciation, and phonetics. These uses, which are rooted in socio-cultural and academic realities, contribute to the deployment of technology in the digital age. While this study reveals the logic behind the use of educational web applications in higher education, there are limitations. The main limitation of the study is that it was conducted only among a limited group of students, which may limit the universality of the results and make it possible to apply them only in specific contexts. Furthermore, the study did not delve into the specific types of web-based educational applications that students were using, which could have provided more insights into how these tools are being utilized in higher education. Additionally, the study did not explore the effectiveness of these web-based applications in enhancing students' learning experiences or academic performance, which could have provided more concrete evidence of their impact. It also did not consider the perspectives of educators or administrators, who play a crucial role in implementing and supporting the use of web-based educational applications in higher education. Understanding their perspectives could have provided a more comprehensive view of the challenges and opportunities associated with the integration of ICTs in higher education in Ukraine.

In conclusion, while the study provides valuable insights into Ukrainian students' perceptions of web-based educational applications, there are several limitations that should be addressed in future research to provide a more holistic understanding of the topic. By considering these limitations, future studies can build upon the findings of this study and contribute to the ongoing discourse on the use of ICTs in higher education.

It should also be borne in mind that the study presented depended on students' responses about their use of educational web applications, and that web applications are developing rapidly, so the study may be relevant only for a certain period of time.

Prospects for future research are to gain a more complete understanding of the topic under study. Thus, other factors such as the availability of the Internet or computer equipment, the type of educational institution, the level of technological equipment of the educational institution, etc. can also be taken into account in the future. Exploring the specific types of web-based educational applications that students are using in higher education and examine how these tools are being utilized in different academic disciplines could be of interest in order to gain more insights into their impact on learning outcomes. The investigation of the effectiveness of web-based educational applications in enhancing students' learning experiences and academic performance by collecting data on students' academic achievements, retention rates, and overall satisfaction with these tools is perspective.

Including the perspectives of educators and administrators in future research to understand their roles and challenges in implementing and supporting the use of web-based educational applications in higher education is also a beneficial perspective.

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Linguistic imagology as a new approach to the analysis of linguistic images: methods and theoretical aspects

La imagología lingüística como nuevo enfoque del análisis de las imágenes lingüísticas: métodos y aspectos teóricos

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Abstract

Linguistic imagology is an approach that is currently being studied in most disciplines of the humanities and social sciences. The relevance of the presented work lies in the interpretation of linguistic imagology as a disciplinary specialisation. The aim is to study linguistic imagology as a subdiscipline of linguistic sciences that deals with the study of the social image of language and its influence on language perception. To reveal the main trends in the development of imagology, emphasising its importance as a promising field in the linguistic sciences. The following results were obtained by analysing the literature. Linguistic imagology is actively developing in Ukraine and requires transversal debates on various scientific approaches. The paper investigates linguistic imagology as a sub-branch of linguistic sciences

Resumen

La imagenología lingüística es un enfoque que actualmente está siendo estudiado en la mayoría de las disciplinas humanísticas y sociales. La relevancia del trabajo presentado radica en la interpretación de la imagenología lingüística como una especialización disciplinaria. El objetivo es estudiar la imagenología lingüística como una subdisciplina de las ciencias lingüísticas que se ocupa de estudiar la imagen social del lenguaje y su influencia en la percepción del lenguaje. Para revelar las principales tendencias en el desarrollo de la imagenología, haciendo hincapié en su importancia como un campo prometedor en las ciencias lingüísticas. Los siguientes resultados fueron obtenidos a través del análisis de la literatura. La imagenología lingüística está en desarrollo activo en Ucrania y requiere debates transversales sobre varias aproximaciones

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that studies the influence of the social image of language on its perception. The article examines linguistic imagology as a subdiscipline of linguistic sciences that deals with the study of the social image of language and its influence on language perception. The conclusions of the paper draw attention to the opposition between approaches that focus on social inequalities and symbolic processes. The practical significance of the work is the identification of imagology as a promising field in the linguistic sciences.

Keywords: interdisciplinary aspect, representation of the linguistic image, social phenomena, text, context.

científicas. El artículo investiga la imagenología lingüística como una subrama de las ciencias lingüísticas que estudia la influencia de la imagen social del lenguaje en su percepción. El artículo examina la imagenología lingüística como una subdisciplina de las ciencias lingüísticas que se ocupa de estudiar la imagen social del lenguaje y su influencia en la percepción del lenguaje. Las conclusiones del artículo llaman la atención sobre la oposición entre enfoques que se centran en las desigualdades sociales y los procesos simbólicos. La importancia práctica del trabajo es la identificación de la imagenología como un campo prometedor en las ciencias lingüísticas.

Palabras clave: aspecto interdisciplinario, representación de la imagen lingüística, fenómenos sociales, texto, contexto.

Introduction

Imagological research in linguistics provides valuable data on the multicultural phenomena that a message reflects, as well as on its possible evolution. It allows us to clearly identify the stereotypes that are consciously or unconsciously transmitted through the texts of any culture. Today, such research opens up perspectives that are informative in the era of globalisation. The research of linguistic imagology is to uncover the myths behind the concept of the image while revealing the techniques and methods that are ready to reveal it. Linguistic imagology is carried out in the field of discourse studies. Most discourse specialists refer to this subdisciplinary branch of linguistics (Lynggaard & Triantafillou, 2023). Likewise, in Europe, linguistic imagology, better known as imagology, is a speciality of linguists interested in the social image of language. In this sense, linguistic imagology (hereinafter referred to as imagology) refers to a field that exists alongside other branches of language sciences, such as syntax, semantics, pragmatics, grammar, stylistics, lexicology, linguistic anthropology, sociolinguistics, rhetoric, etc. (Yantsos, 2022). These two spaces of discourse meaning research have been crucially inspired by theoretical discussions in the social sciences (Pliasun, 2018). But if from the very beginning, imagologists were interested in linguistic images and their impact on the perception and understanding of language, today researchers are expanding the scope of analysis, combining this approach with methods from linguistics, psychology, cultural studies, and other fields of science, which allows them to reveal complex relationships between linguistic structures, images, and semiotic systems, thus not being limited to one discipline.

The linguistic image has always been a cross-cutting issue that has led many linguists to enter into dialogue with the social sciences, allowing sociologists, political scientists, historians, and other disciplines to understand language as a fundamental dimension of social phenomena (Aliyeva, 2023a).

Imagology and discourse analysis

Imagology is an important branch of linguistics whose research is included in discourse analysis in various fields of knowledge. While most researchers consider linguistic imagery to be part of this field, imagology is a larger context that is shaped by interdisciplinary symposia, conferences, and publications (Le Juez, 2021). Within the framework of linguistic imagery, imagology analyses well-known phenomena in the fields of knowledge, culture, and media in contemporary society. However, it also explores theories and methods that reveal social practices and the creation of meaning. Linguistic research, central to this multidisciplinary field, examines the theories and practices of the social impact of language, power, and knowledge (Zocco, 2022). Another dimension of imagological research is the transmission of literary representations between authors, between groups, but above all from one period to another: reuse, persistence, modification, discontinuity (Pliasun, 2018). The study of the birth, life evolution, and eventual disappearance of images is carried out through their influence. This opens up the possibility of comparative analysis, for example, of parallel phenomena. Finally, by going beyond its technical nature, the imagological approach leads to the structures of identity thinking and its driving forces. Imagology inevitably leads to a fundamental relativisation of the characteristics attributed to groups and their cultures.

This study examines different aspects of imagology in order to identify the main trends. At the theoretical level, the interaction between critical approaches that focus on social inequalities and studies of symbolic processes, such as discourse analysis, is examined. At the practical level, the article compares studies that focus on the materiality of language forms with those that consider the creation of meaning through a hermeneutic approach.

Literature review

In recent years, linguistic imagology has emerged as a new approach to the analysis of linguistic images, focusing on methods and theoretical aspects. The study of linguistic imagology emerged as a response to the crisis that arose in classical linguistics due to changes in the scientific paradigm. Since the post-war period, this discipline has begun to explore the limits of the grammatical vision of language and go beyond the sentence. As a result, three main approaches have emerged in the analysis of the language image of post-structuralism: pragmatic, interaction (or pragmatic), and semantic (Aliyeva, 2023b).

By analysing the context, pragmatists study imagology as a product of the linguistic activity, while interactionists study the interaction between communication participants as the basis of social practice (Martynenko et al., 2023). Thus, the linguistic image is considered from a social point of view and needs to be analysed through the prism of sociological methods.

It is important to note the tendencies that influence the perception of the meaning of words, phrases, and texts in context, and which are related to shared social and historical knowledge (Köhler, 2022). This indicates that imagology analyses the spaces of interaction where images of utterances are formed.

It is possible to distinguish at least two methods of constructing the object of study of imagerology: the European modus operandi, which focuses on the top-down view and inequalities and power relations in society (the social aspect of the linguistic image) (Bregasi & Bikaj, 2022), and the Anglo-American modus operandi, which prefers the bottom-up view and focuses on individual potential within the framework of receptive theory (Kemmerer, 2023).

Methodological division of imagology

There are also methodological divisions in social research that encompass both quantitative trends in corpus linguistics (Guercini & Lechner, 2023) and qualitative approaches such as interactionist and ethnographic (Tantos & Kosmidis, 2023).

As a subfield of linguistic sciences, imagology is seen as an alternative to mainstream trends in linguistics, which often limit themselves to words and sentences without addressing the context of the linguistic image in which they are used. Fetzer (2023) considers imagology to be the result of a fusion of structuralism, historical materialism, and psychoanalysis. Whereas Bateman & Tseng (2023) remain faithful to structuralist and distributionist conceptions of language, linking the linguistic image to social processes in society.

Imagology in the pragmatic field

Pragmatists such as Hu & Mei (2021) see linguistic imagery as the way in which images indicate their context through their utterances. They move the idea from the contextualisation of expressions in social structures (society) to the contextualisation of activities that constitute the space of society. Linguistic meaning is then seen as the result of the creative activity of discourse participants, rather than a simple extension of predictable linguistic and social structures.

From the very beginning, imagologists have developed approaches that focus on pragmatics and interaction in imagology (Blažević, 2012). Critical discourse analysis, focusing on social issues, inequality, and discrimination, sees imagology as a way of identifying social problems through linguistic images (Valdeón, 2018).

Thus, it can be argued that all these methods and theoretical aspects in combination allow us to create a comprehensive approach to the analysis of linguistic images, which is designed to reveal their semantic potential and influence on the perception and understanding of language in general. Linguistic imagology opens up new opportunities for the study of linguistic and cultural practice and the reflection of linguistic images in the modern world.

Previous studies have utilized both quantitative and qualitative methods, including content analysis and analysis of literary sources, to examine linguistic imagology. These studies have drawn on national and international publications, as well as personal experience and expert opinions, to analyze theoretical concepts and ideas in the field. While these studies have provided valuable insights and identified trends in the field, they are limited by the scope of the literature reviewed and the methodologies employed. Future research could benefit from incorporating a wider range of sources and methodologies to further elucidate the concept of linguistic image and its implications.

In conclusion, the current study on linguistic imagology presents a valuable contribution to the field of linguistics by introducing a new approach to the analysis of linguistic images. The study outlines the methods and theoretical aspects of linguistic imagology, emphasizing the importance of examining the cultural, social, and psychological factors that shape these linguistic images. By delving into the depths of language and uncovering the underlying meanings and implications of linguistic representations, linguistic imagology sheds light on the complexities of communication and the ways in which language influences our perceptions and interactions. This innovative approach opens up new avenues for research and exploration in linguistics, offering valuable insights into the power of language in shaping our worldviews and identities.

Methodology

The research methodology includes both quantitative and qualitative methods of analysing the relevant scientific literature, as well as content analysis methods. The study is based on the analysis of national and international publications on linguistic imagology, as well as the author's own research. The methods used included the analysis of literary sources, the study of theoretical concepts and ideas in the field of linguistic imagology, as well as the use of personal experience and expert opinions. In order to solve the research tasks, analytical and interpretative approaches were used. The article takes into account the scientific opinion of leading scholars in the field of linguistic imagology, as well as the analysis of publications by Ukrainian and foreign researchers. In addition, the method of comparative analysis is used to compare approaches to the study of linguistic imagology in different countries. The article includes the results of the study of the above methods, the analysis of well-known theories in this field, comparative characteristics of approaches to linguistic imagology in Ukraine and abroad, as well as suggestions for further research in this area. This approach to the study allowed us to obtain comprehensive results, as well as to make a comparative analysis of approaches and theories possible, which helped to categorise the concept of linguistic image in a transdisciplinary way. The use of various methods made it possible to study the problem of imagology in linguistics in depth, as well as to identify new patterns and trends in this area. Thus, the reasonable choice of research methods in this article allowed us to obtain complete and substantiated results that may be useful for scholars working in the field of linguistic imagology, as well as for all those interested in this topic.

The study included a sample size of over 100 national and international publications on linguistic imagology, as well as the author's own research and personal experience. The article also considered the scientific opinions of leading scholars in the field of linguistic imagology, as well as the analysis of publications by Ukrainian and foreign researchers. In addition, a method of comparative analysis was used to compare approaches to the study of linguistic imagology in different countries. Overall, the sample size used in the study was diverse and comprehensive, allowing for a thorough analysis of the concept of linguistic image in a transdisciplinary way.

The selection criteria of the literary sources analyzed in this research include relevance to the topic of linguistic imagology, credibility of the source, and currency of the publication. The research methodology also considers the diversity of perspectives represented in the literature, both nationally and internationally, in order to provide a comprehensive understanding of the topic. The inclusion of theoretical concepts, empirical studies, and expert opinions ensures a well-rounded analysis of the subject matter. The use of both quantitative and qualitative methods allows for a thorough investigation of linguistic imagology from multiple angles.

Overall, the research methodology employed in this study is robust and well-suited to the complexity of the topic of linguistic imagology. By incorporating a variety of sources and methods, the study is able to offer valuable insights and contribute to the existing body of knowledge in this field.

Results and discussion

Linguists study imagology to uncover the significance of linguistic images in communication and culture, as well as to understand the social meaning of language (Jalilbayli, 2022a). Imagology is a new approach in linguistics that combines theoretical and methodological aspects of semiotics, cognitive science, cultural studies, sociology, and history (Skakun, 2022). This approach belongs to a multidisciplinary field of knowledge that is actively studied in the context of neo-criticism, which expands psychoanalytic questions and supports trends of innovation in linguistics and social sciences (Jamalli, 2023).

Neo-criticism has become a widespread European theory. The main topic of debate in this area is the decentralisation of the individual subject and the questioning of deterministic models of structure. After the linguistic turn in the social sciences, new concepts made the linguistic image a major issue outside of linguistics. In the humanities, image defines the limits of "representation", criticising the idea of transparent language that reflects the consciousness or intentions of the subject. In the social sciences, image is used to overcome naïve realism, which rejects the social consequences of discursive practices and classical models of the actor as a source of social action (Sato, 2022).

By exploring linguistic imagology as a fresh perspective in examining language images, scholars can connect the theoretical dimensions of this concept with poststructuralist theories across linguistics, social sciences, and humanities. The primary aim of this inquiry is to grasp the effects of language on shaping and interpreting the world, the development of linguistic images in the human mind, the impact of psychological and cultural elements on their construction and interpretation, and the representation of socio-cultural and historical contexts. Furthermore, it is crucial to investigate how linguistic images can be utilized to influence awareness and cultivate stereotypes (Ikhlef & Awad, 2023). Thus, the theoretical aspects are primarily related to how language means to influence the representation and perception of the world, how language images are formed, related to the influence of language means, how they influence the representation and perception of the world, and the formation of language images (Fig. 1):

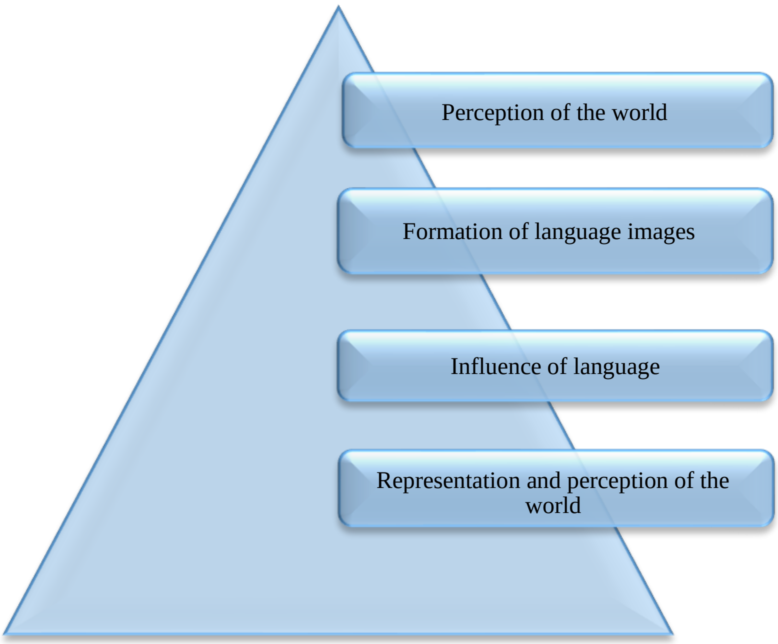

Figure 1. Theoretical aspects of imagology.
Source: author's own development.

In the linguistic sciences, which draw on other fields that study linguistic phenomena (anthropology, communication, literature, philosophy, etc.), the emergence of imagology is a symptom of the crisis of classical linguistics based on language as a grammatical structure (Alejandro & Zhao, 2023).

By addressing the dimension of the language image, linguists move away from the concept of language as a closed system and open up the social and historical contexts of language activity (Ćwikła & Lindell, 2023). The linguistic image thus allows linguists to go beyond the purely linguistic sphere (discourse = text + context) and open themselves to the methods and theories used in the social sciences to study empirical objects.

In the social sciences, in particular, in sociology, political science, and pedagogy, imagology points to the emergence of trends that challenge the way in which social realities are constructed by actors (constructivist aspect), as well as the way in which actors are created in and through discursive practices (deconstructivist aspect) (Skórczewski, 2015). This constructivist and deconstructivist tendencies in the social sciences are linked to poststructuralist theories that question the objectivity and the subject as the centre of intentional action. This critical orientation of poststructuralism is evident in studies of political discourse (Leerssen, 2022). If poststructuralism is one of the movements that illuminates social and political issues on a theoretical level, it also reminds us of the importance of the linguistic image in contemporary society, in particular in the construction of subjectivities in the media, in popular culture, and in the dynamics of political power.

In the humanities, in particular in literature, philosophy, history, and linguistics, imagology coexists with the critique of language as a means of expression that can be viewed from a symbolic and political perspective (Sofilkanych, 2022). The symbolic aspect of the linguistic image is subject to analysis, given that linguistic and cultural expressions are no longer a reflection of the author's consciousness, but are part of a complex network of representations (Jalilbayli, 2022 b). It is necessary to take into account the influence of the conditions in which ideas arise, as the philosophical orientation of the linguistic image collides with the materiality of speech (Kharitonenko, 2022). This stimulates the emergence of more systematic reflective questions in the fields of history and anthropology.

Imagology also encompasses representation in its political aspect (Dinç, 2023). Postcolonial studies and sexual identity studies remind us that through linguistic imagery, people determine who can speak for whom, thereby establishing their place in the social field of power.

In these three interdisciplinary spaces, the meanings of imagology as a new approach to the analysis of linguistic images often mix and overlap, but there are also differences that hinder exchange between disciplines. It should be noted that the interest of the linguistic sciences in imagerology does not always reflect the intellectual and epistemological impulse of neo-criticism observed in the multidisciplinary space of the humanities and social sciences (Liao et. all., 2023). While in the linguistic sciences, the concept of a linguistic image belongs to the disciplinary field of specialised research, in other disciplines it denotes a more transversal and intellectual issue.

In Europe, the interest in imagology is the result of the collision of empirical social research with the philosophical culture of the humanities (Wojtyna, 2018). But the conjuncture of this approach is not universal. In the United States, for example, imagerology is struggling to establish itself as a field of study, although the concept of linguistic image is indeed commonplace, especially in linguistic anthropology and sociolinguistics, which understand image primarily as its semiotic derivative (Desjardins, 2023).

Thus, the debate over imagology turns out to be a unity of different intellectual fields. Sometimes one can reasonably question the commonality of the approaches of a linguist and a philosopher, a linguist studying corpora, and a cultural critic theorising the relationship between language and power. The wide range of interdisciplinary debates around the linguistic image confirms that imagerology plays a more important role than just within one discipline and is part of the broader field of language and society, where linguistic, social, and human sciences interact.

After this detailed theoretical analysis, it is possible to identify the main axes that define the interdisciplinary field of Imagology. This field is the result of an exchange of ideas around some of the problems that can be observed in the disciplines described (Figure 2):

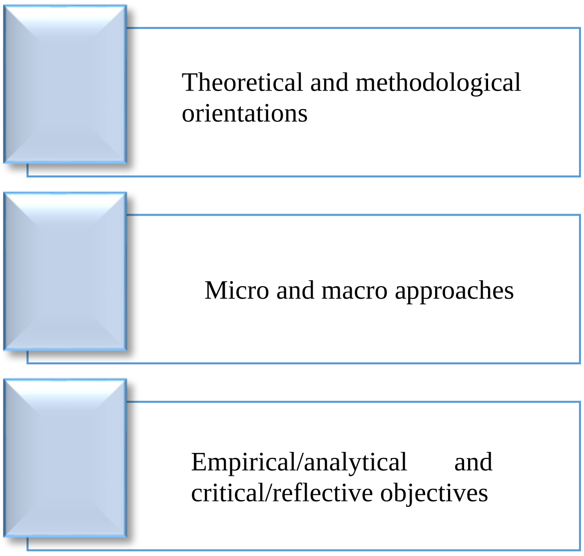

Figure 2. The interdisciplinary field of imagology.
Source: author's own development.

Imagology becomes a specialised field of study when it mobilises methodological research tools (such as corpus analysis, discourse analysis, or ethnography) in light of theoretical and epistemological questions about the production of images in society (Zhang & Zhang, 2022). The foundational nature of epistemological discussions around linguistics, philosophy, ethnography, literature, and psychoanalysis in the emergence of imagology is well known. If this theoretical and intellectual fervour in the linguistic sciences has waned, it can be seen that theories of imagology continue to develop in the Ukrainian humanities. Thus, there is a debate around imagology, especially in fields that are defined by a particular philosophical culture, such as literary studies and cultural studies, as well as in parts of political science and sociology.

Imagology is explored as a distinct field when it applies methodological tools such as corpus analysis, conversational analysis, and ethnography to study the theoretical and epistemological aspects of the formation of public linguistic images (Zhang & Zhang, 2022). Rooted discussions around imagology are established in linguistics, philosophy, ethnography, literature, and psychoanalysis. Although interest in imagology in the linguistic sciences may be declining, Ukrainian humanities continue to develop its theories. This leads to an active debate on imagology, especially in fields that focus on a particular cultural philosophy, such as literary studies, cultural studies, political science, and sociology.

It should be noted that imagology as a new approach to the analysis of linguistic images is not easy to formulate with the help of methodological tools that can be found in the space defined by the relationship between language and society (Zavalniuk et al., 2022). Drawing on methodological advances in social research, methodologies today largely determine the identity of imagology as a subfield of linguistics. Methodological innovations in Imagology have followed other fields of social science, such as ethnographic approaches, interviews, and multimodal approaches, which have demonstrated greater sensitivity to the complexity and heterogeneity of its objects.

Imagology goes beyond the classical approaches (which are often limited to a corpus of written texts) and aims to take into account the meaning of the linguistic image as a result of practice in its social dimensions (Sofilkanych et al., 2023). Thus, researchers are faced with a choice between an analytical approach aimed at deciphering the linguistic image that organises the production of social meaning and an interpretive approach based on a holistic understanding of the complex phenomena of linguistic image meaning production and having a more theoretical orientation (which can lead to the improvement of the model without conducting field research).

To explain the social production of linguistic imagery, imagologists use macro or micro perspectives in the social sciences. The macro perspective focuses on traditions that define the limits of social action. Here, actors are subject to a structure of inequality or power, while following the rules of society as an institutional order (Maraieva, 2022). These constraints are often unconscious to the individuals who are subject to them. If actors reproduce social images, they also produce them through their actions, the results of which can be unpredictable. Contemporary approaches such as governance point to the constructivist nature of power and the role of language image in the construction of social order (Cekaite & Björk-Willén, 2013). The linguistic image not only reflects social reality but also participates in its creation. This means that social groups can be organised through images, which are interpreted in different ways in different fields.

The gap between micro- and macro-perspectives defines much of the formation of representations in general and extends to many other fields where imagology is important (e.g. linguistics). In linguistics, there is a tension between macro (or critical) approaches, which emphasise the power aspect, and micro (ethnomethodological) approaches, which are based on the (methodological) principle that the interpretation of an image is only important in the relevant context.

It is now becoming apparent that interest in imagology can arise from different motives. Some linguists turn to linguistic imagery because they are interested in concrete observations rather than theoretical reflections (Kravets et al., 2021). In general, imagology is often aimed at specific empirical studies (Kozlova & Polyezhayev, 2022). Therefore, methods (e.g., qualitative or quantitative) are important for studying social meaning-making. Thus, the concept of language image can include not only empirical goals but also approaches with a critical orientation that aim to improve the methods of analysing language image, not just describe them.

Criticism, in the context of reflexivity, can refer to the relationship between studies of imagology. Indeed, linguistic imagology is a complex phenomenon, but its effectiveness lies in the fact that images are reflected in language. The interdisciplinary aspect of imagology includes critical and reflective tendencies that contradict the social and historical context. Scholars emphasise the importance of considering the conditions of the possibility of imagology in the humanities, recognising the importance of social and historical conditions for the development of its concepts. In this regard, Blažević (2012) discusses the resurgence of nationalism and identity politics in the context of imagology studies, examining perceptions and stereotypes about national character. This research aligns with Blazevic's work by exploring the relationship between rhetoric, discourse, literature, and international relations. Imagology is a growing field within literary studies and the humanities, as noted by Cwikla & Lindell (2023) who analyze its theoretical and practical aspects. Hu & Mei (2021) also emphasize the significance of imagology in their study of scholarly articles, highlighting its role in understanding societal values. The contemporary focus on linguistically constructed realities in various fields underscores the relevance of imagology and its ongoing development and potential for growth in the era of globalization. In their examination of the theoretical and practical dimensions of imagology over the last decade, Ćwikła & Lindell (2023) highlight its significance and potential for advancement in the context of globalization. Meanwhile, Hu & Mei (2021) conduct a complementary study on academic works related to imagology, pinpointing prevalent themes and affirming its crucial role in literary and humanities research. They contend that the contemporary landscape affords ample opportunity to explore the socially and culturally constructed nature of various values through linguistic imagology. We concur with this assertion, as imagology transcends disciplinary boundaries, underscoring its relevance, potential for growth, and ongoing evolution in modern scholarship. An analysis conducted by Köhler (2022) revealed the key research areas within contemporary imagology, affirming that the focus has shifted from individual images to their interconnected relationships and associative links. The study also highlighted the importance of examining the temporal boundaries of image dissemination and the evolving content elements, underscoring the multidisciplinary nature of imagology in current scholarship.

By combining different disciplines, approaches, and theories, imagology becomes a universal tool, contributing to the political deconstruction of nationalist ideas and promoting better international cooperation. In global studies, imagology can break down stereotypes between nations and help find ways to cooperate.

For example, in the field of literature, imagology can be used to analyze how different cultures are portrayed in works of fiction. By examining the stereotypes and assumptions present in these portrayals, scholars can better understand how these images shape public perceptions and influence international relations.

In the field of film studies, imagology can be used to analyze how different countries and cultures are depicted in movies. By deconstructing the images and narratives present in these films, researchers can uncover underlying biases and prejudices, and work towards promoting more accurate and respectful portrayals of different societies.

In the field of political science, imagology can be used to analyze how nationalist ideologies are constructed and perpetuated through images and symbols. By examining how these ideologies shape policies and actions, scholars can challenge and dismantle harmful nationalist narratives, and promote a more inclusive and cooperative international community.

Conclusions

Linguistic Imagology deals with the study of the social image of language, existing alongside other branches of linguistics. This sub-discipline of linguistics studies language images and their impact on the perception and understanding of language, expanding the scope of analysis by using methods from linguistics, psychology, cultural studies, and other sciences. Language images reveal complex relationships between linguistic structures, images, and semiotic systems, encouraging specialists from different disciplines to debate and understand language as a fundamental dimension of social phenomena.

This paper explores the disciplinary fields in order to identify the trends that constitute the main axes of imagology. At the theoretical level, the paper highlights the productive rivalry between approaches that emphasise social hierarchies and inequalities (here we refer to critical movements) and those that study symbolic processes (e.g. in discourse analysis) and, at the methodological level, the choice that can be made between works that insist on the materiality of language forms (favouring quantitative or qualitative research tools) and those that approach the production of meaning more from a hermeneutic point of view (relying on the actors' capacity for understanding, with reference to images).

Imagology has established itself in science as a subfield in the linguistic sciences. Linguistic Imagology is a relatively new field that has emerged at the intersection of disciplines and whose existence is still in doubt. In this paper, a critical analysis of the related literature has allowed us to identify the organising axes of this transdisciplinary field, which occupies a central position in the space at the crossroads of language and society. By creating a space for the intersection of disciplinary and national traditions, imagology testifies to the interest of researchers from various disciplinary fields in this object today.

Prospects for future research call for an analysis of the integration of the praxeological turn observed in the humanities and social sciences. Considering imagology from this perspective would allow us to reinvest the language-image-knowledge nexus as a theoretical and empirical object in its own right, to push the critical ambitions of imagology further and thus to reaffirm its role in the multidisciplinary space of the humanities and social sciences.

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Integration of environmental indicators into the management decision-making system

Integración de indicadores ambientales en el sistema de toma de decisiones de gestión

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Abstract

Climate change demands integrating environmental indicators into management decision-making systems, highlighting shifts towards environmental safety and stricter emissions regulations. This research develops a scheme for such integration, filling the gap in literature on the relationship between environmental factors and management decisions. Literature analysis and data examination through scientific and mathematical methods, including linear and multicriteria analysis, have led to a model emphasizing the importance of embedding environmental considerations into decision-making. The

Resumen

El cambio climático exige integrar los indicadores ambientales en los sistemas de toma de decisiones de gestión, destacando los cambios hacia la seguridad ambiental y las normativas más estrictas sobre emisiones. Esta investigación desarrolla un esquema para dicha integración, llenando el vacío existente en la literatura sobre la relación entre los factores medioambientales y las decisiones de gestión. El análisis de la bibliografía y el examen de los datos mediante métodos científicos y matemáticos, incluido el análisis lineal y multicriterio, han dado lugar a un modelo que subraya la importancia de integrar las consideraciones medioambientales en la toma de

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findings highlight the role of multi-criteria decisions in various conditions and establish a comprehensive model for the interplay between economic and environmental indicators, enhancing eco-efficiency in management practices. This approach introduces a novel method for incorporating environmental sustainability into management strategies, underscoring its significance for ongoing research and application in eco-efficient management decision-making.

Keywords: management decision, environmental performance, eco-efficiency, climate change.

decisiones. Los resultados ponen de relieve el papel de las decisiones multicriterio en diversas condiciones y establecen un modelo integral para la interacción entre indicadores económicos y ambientales, mejorando la ecoeficiencia en las prácticas de gestión. Este planteamiento introduce un método novedoso para incorporar la sostenibilidad ambiental a las estrategias de gestión, subrayando su importancia para la investigación en curso y su aplicación en la toma de decisiones de gestión ecoeficientes.

Palabras clave: decisión de gestión, rendimiento medioambiental, ecoeficiencia, cambio climático.

Introduction

In order to reveal the topic of our work, it is first of all necessary to answer the following questions: what a management decision is and how is it related to ecology.

The first question can be answered by saying that a management decision is the result of an alternative formalisation of economic, technological, socio-psychological, and administrative management methods, on the basis of which the organisation's management system directly affects the managed system, but there are many more interpretations of this concept.

The answer to the second question is that the environment is the physical, biological, cultural, social and economic environment in which people, plants, animals and all other living things are connected throughout life. There are several historical examples of such decisions that have led to such consequences that it has become a well-known fact. Here are some of the most famous examples:

- It is the situation with rabbits and cats in Australia;
- The problem with the environment and human health due to the use of certain herbicides in America, Germany;
- The distribution of lead compounds throughout the world as result of their use as additives in petrol.

It should be noted that these solutions were initially quite successful, and their harmfulness was discovered later. But today, in addition to the usual problems, the climate issue has already gone beyond environmental protection and has also become an economic topic. The social sphere, including production, infrastructure, etc., now depends on the environmental situation. An example of how climate change leads to economic and production problems hydropower plants is, which have become significantly less productive due to drought and produce between 40 and 6% of their rated capacity. As Bloomberg put it “the world's biggest source of green energy is rapidly evaporating”. Therefore, the countries most affected by this are facing the need to obtain energy from other sources, which in turn are affected by other environmental and climatic factors, for example, smoke from forest fires reduces solar energy production. In other words, the quality of human life is now overwhelmingly dependent on climate, ecology, economics, and politics, as shown schematically in Figure 1.

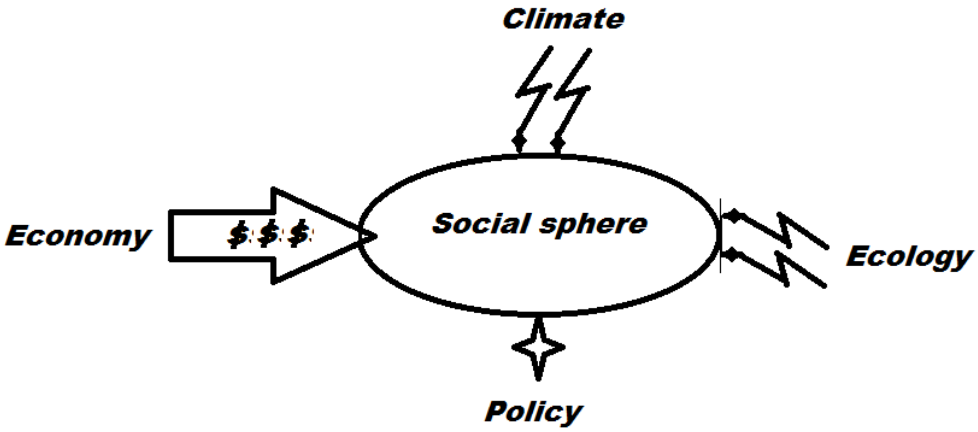

Fig. 1. Factors affecting human life.
Created by the authors

Climate change is forcing more attention to be paid to the environment. This is reflected in policy changes towards "greening", the creation of stricter environmental safety conditions, increased emissions control, downward changes in regulations, especially for CO2, methane, exhaust gases, water, etc., and increased fines for violating environmental safety rules, which accordingly affects the economy, which is also rapidly "greening" (Sembiyeva et al., 2023). Therefore, the integration of environmental indicators into the management decision-making system becomes extremely necessary. However, the question arises: how and at what stage of making a management decision should this be done? How does the environmental policy of states influence management decisions taking into account environmental indicators?

This work is based on the study and analysis of research by various authors concerning both management issues taking into account environmental indicators and issues related to the influence of environmental policies of some countries on management decision making. The work makes an attempt to build a model that allows us to imagine the interaction of the management decision-making system with economic and environmental indicators. The main feature of this model should be the possible versatility.

Literature review

Among the works devoted to this topic are those related to reporting forms that take into account environmental indicators Bezuidenhout, de Villiers, & Dimes (2023), Abdullaeyeva & Ataeva (2022), practical studies of the use of environmental indicators in performance management, works Shi et al., (2019), Zharfpeykan, & Akroyd (2022), Shakun (2022), Briushkova, Nikoliuk, & Udovytsia, (2020).

The concept of managerial decision has been carefully studied by the authors Karpenko & Kobzar (2021), Anishchenko (2019), Bezuidenhout et al (2023).

The authors of the study Schaumberger & Dasayanaka (2023) noted that in recent years, much more attention has been paid to how companies affect the environment and governance. The authors interviewed six large Swedish companies and collected data that allowed them to draw conclusions about the impact of changes towards sustainable development. It was found that, firstly, a huge number of rules and guidelines were passed everywhere; secondly, it had a negative impact on the harmonisation of reporting within companies; thirdly, companies use their reports as marketing tools. Almost all of the companies surveyed use the GRI (Global Reporting Initiative) index as their sustainability disclosure framework. However, the findings indicate that companies desire a unified reporting framework, such as future integration with CSRD (sustainability reporting) and see potential benefits and some specific current challenges related to sustainability reporting.

In Shi et al., (2019), based on the study of regional sustainable development as a complex system that is difficult to assess objectively and scientifically using a single method. The authors presented a new integrated indicator system and evaluation model that most accurately reflects the regional level of sustainable development The indicator system and evaluation model were built using the results of a study of 17 cities in China The indicator system includes 4 subsystems, i.e. economy, society, resources, and the environment These indicators were selected through correlation analysis and discriminant analysis A neural network was used to estimate the respective scores of the 4 subsystems The composite indicator for regional sustainable development was assessed using an entropy-corrected analytical hierarchy process.

In Fernandes et al., (2023), a conceptual model is developed to describe the internal relationship environment (IRE). Critical factors affecting the environment, characteristics of the parties involved, and the relationship. The work is mainly concerned with the formation of a management system - successful implementation or external and market, taking into account environmental factors The conceptual model and its tools describe the relationship between the support team and operational groups, described by the ER model of company management.

LearningForSustainability.net offers the development of indicators for performance-based sustainable management. There is a global trend towards the wider use of indicators to monitor development and track progress. This is evident at all levels and is reflected in the proliferation of indicator reports in recent years. Indicators quantify and simplify a phenomenon and help us to understand and make sense of current realities. In the context of natural resource management, their greatest strength lies in the way they can help us assess the status of a resource and monitor the efficiency of its use. To be more meaningful, a monitoring programme should provide insight into the relationships between environmental or socio-economic causes and stressors, as well as the expected responses of the ecosystem and subsequent economic outcomes.

The issue of understanding and assessment is raised - what should be assessed. Within resource management, these are typically either programme-based or driver-based. Regardless of which structure is chosen, the report notes that it will be important to provide three sets of supporting information to prepare the utility and transparency of subsequent models, reflecting:

– plans and planning;
– well-documented core proposals;
– internal and external factors affecting outcomes. Attention is paid to the indicator Characteristics and system capacities required to support interoperable adaptive management.

The authors of Lin et al., (2020) studied a control system based on the fuzzy Delphi method. Using this method, they evaluated expert opinion on each indicator that affects decision-making Zharfpeykan & Akroyd (2022) investigated how different factors influence whether companies integrate economic, social, and environmental performance into their performance management system. Managers from 239 Australian and New Zealand companies across a wide range of industries were surveyed. The researchers used hierarchical multiple regression analysis for the analysis. The study found that industry, company size, and managers' perceptions of the importance of sustainability influenced the integration of environmental performance into a company's performance management system. In particular, larger companies and companies in industries with low environmental impacts tend to integrate more indicators into their performance management systems, especially if sustainability is perceived by managers as important for performance. Large companies and companies in industries with significant environmental impacts integrate social indicators, but generally not environmental indicators, into their performance management systems. The inclusion of environmental indicators in corporate sustainability reports does not affect their integration into the company's performance management. The framework thus emphasises the lack of synergy between external sustainability reports and performance management. At the same time, the authors believe that organisations need to address the issue of integrating environmental indicators in order to become more environmentally sustainable. Similar results were obtained (Sayed, 2023).

According to the website Ministry of Environmental Protection and Natural Resources of Ukraine, (s.f), “environmental indicators are the main tool for assessing the state of the environment in the countries of Eastern Europe, the Caucasus, and Central Asia. Appropriately selected indicators based on sufficient time series of data (time trends) can not only reflect the main trends but also contribute to the analysis of the causes and consequences of the current environmental situation. They also allow us to monitor the implementation and effectiveness of environmental policy in countries”.

We should also note the development of artificial intelligence and neural networks (machine learning) and the prospects for their use, including in management decisions. These issues are addressed by the authors Entezari, Aslani, Zahedi, & Noorollahi (2023), Khalid (2023), Rakhimov (2023), Waas et al., (2014).

Using search theory and dynamical systems theory, the authors of Ye et al., (2022) studied ecological dynamism in the model of the relationship between green entrepreneurial orientation and the search for boundary intervals related to the environment, economy, and social sphere.

Numerous publications on the interaction between ecology and management decisions reflect a deep interest in this topic. However, the different approaches demonstrated by the authors require further research and there is still a wide scope for further work.

The purpose of our work was to develop a scheme for integrating environmental indicators into management decision-making systems.

Let us highlight the main problems raised by the authors of publications reviewed:

Problems with the reporting format lead to differences between external and internal reporting companies. Reporting does not keep pace with changes in the environmental policy, which leads to the emergence of many instructions, orders, rules that negatively affect harmonization reporting within companies, and also makes it difficult to take the necessary management decision. Also, although most companies in developed countries use the GRI (Global Reporting Initiative), there is still no unified form of reporting and connection to the CSRD (reporting about sustainable development).

There is a problem of integrating environmental indicators into the performance management systems companies. For large companies in different countries, the inclusion of environmental indicators in corporate sustainability reports do it not affect the integration of these indicators into management efficiency of companies. Large companies and companies in industries that have a significant environmental impact, integrate social rather than environmental indicators into decision-making systems. There are no unified models that allow assessing the impact of integrating various indicators into systems for making management decisions of companies. Thus, taking into account the identified problems, the goal of our work was to develop a scheme integration of environmental indicators into the management decision-making system. Also with taking into account the difference in approaches to solving this issue in different industries and companies, the diagram should be visual and practically universal.

Methodology

Literature analysis was used as a research tool, and information from open sources, including news publications and news agencies, was studied and processed BloombergNEF (2023), Learning for Sustainability (2016). Methods of scientific analysis, comparison; generalisation; data visualisation etc. were used, Microsoft Office 10 was used to work with the data.

Results and discussion

The rule of choice is the basic principle of making a management decision based on the results of monitoring activities, namely diagnostics and forecasting. Decision-making theory distinguishes between single-criteria and multi-criteria choices under conditions of certainty, risk, and fuzzy conditions. Management decision-making should be viewed as a constantly solved task in the management process Young (2023), Hryshyn (2014), Kuzmin & Melnyk (2003), Anishchenko (2019), Rahi, Johansson, Blomkvist, & Hartwig (2023), Rahi et al. (2022).

The task of making a managerial decision is aimed at determining the most effective way of action to achieve the set goals.

The process of managerial decision-making is accompanied by the formation of alternative solutions and the assessment of their benefits.

The stages of managerial decision-making are shown in Table 1.

Table 1.
Stages of managerial decision-making according to different authors

Stages of managerial decision-making		
According to (Young, 2023) 1. Defining the goals of the organisation; 2. identifying problems in the process of achieving the defined goals; 3. researching problems and linking their features 4. Search for solutions to the problem; 5. Evaluating all alternatives and choosing the best one; 6. Coordination of decisions in the organisation; 7. Approval of the decision; 8. Preparing the decision for implementation; 9. Managing the implementation of the solution; 10. Checking the effectiveness of the solution.	According to (Hryshyn, 2014) 1. The emergence of a situation that requires decision-making; 2. Collection and processing of information on the developed management methods; 3. Identification and evaluation of alternatives inherent in the developed management methods; 4. Preparation and optimisation of a management decision that is taken as a set of alternatives; 5. Making a management decision (legitimising the alternative); 6. Implementation of the management decision and evaluation of the result.	According to Kuzmin & Melnyk (2003) 1. The existence of a situation that needs to be addressed, collection and analysis of information on the general problem; 2. Identification and evaluation of alternatives inherent in the developed management methods; 3. Making a management decision (legitimisation of alternatives); 4. Implementation of the management decision and evaluation of results; 5. Control over the implementation of the decision, which allows to detect deviations and establish feedback between the controlling and managed subsystems.

Created by the authors based on works by Young (2023), Hryshyn (2014), Kuzmin & Melnyk (2003).

It is possible to formulate the tasks of managerial decision-making, which can be both individual and group, the data are presented in Table 2.

Table 2.
Approaches to managerial decision-making

Centralised approach	Decentralised approach
Most decisions are made by top management	Transfer of decision-making responsibility to a lower management level
Individual approach	Group approach
Decision-making by the manager alone	Several employees work together on the same problem
The task of making an individual managerial decision: in a problem situation, with the available time and resources to make a managerial decision, it is necessary to define the situation by a set of alternative situations, formulate a set of goals, constraints, alternative solutions, evaluate the benefits of solutions and find the optimal solution from the set, guided by the selection criterion	The task of making a group management decision: in a problem situation, with available time and resources, it is necessary to define the situation by a set of alternative situations, formulate a set of goals, constraints, alternative solutions, evaluate the benefits of solutions, build a group preference function based on the principle of consent and find the optimal solution that would meet the group preference

Compiled by the authors based on data from Anishchenko (2019), Young (2023)

Environmental and economic indicators are a criterion for the development of environmental management, which requires a comprehensive and systematic approach to the formation of such indicators.

The degree of environmental impact of production is determined by a cluster of quantitative and qualitative indicators, including:

- the amount of raw materials and energy used;
- amount of gaseous pollution emitted;
- amount of waste per unit of output;
- efficiency of raw material use;
- energy efficiency;
- number of accidents resulting in negative impact on the environment;
- the degree of utilisation of production and consumption waste;
- potential of packaging for further recycling;
- transport mileage per unit of finished product;
- investments made in environmental protection;
- the number of lawsuits resulting from environmental violations, etc. (this also applies to administrative fines for minor violations).

Thus, eco-efficiency can be presented as a system of interaction of economic and environmental indicators with the management system or as a system of making management decisions based on the interaction with environmental and economic indicators, as shown in Fig. 2.

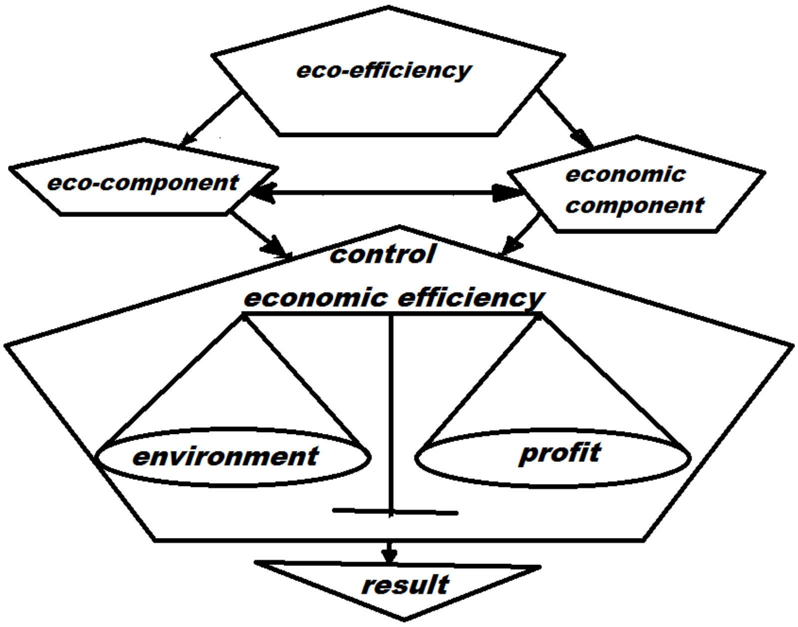

Fig. 2. General scheme of interaction between the management decision-making system and environmental and economic indicators.

Built by the authors based on studying the works of Young (2023), Bosi, Lajuni, & Lim (2022), Clement, Robinot, & Trespeuch (2023), Correia (2019), Kerr & Rouse (2015), Weston, & Ninadi (2021), Park, Konge, & Artino (2019), Traxler, Schrack, & Greiling (2020).

The scheme reflects the interaction of environmental and economic indicators on management decision-making to achieve environmental efficiency.

Let's look at specific example of such interaction.

Examples of decisions focused only on profit.

Increasing requirements for the quality of disposal of electronic waste has led to the fact that according to Adesina (2012).

1) Outdated electronics (computers, mobile phone, televisions, refrigerators, etc.) are imported into developing countries as "second-hand goods" and are sold though out ventures in order to obtain arrived. And .the problems of further disposal fall on the buyer.
2) In addition, according to the some agencies and organizations through donations send them to schools, hospitals, etc., thus getting rid of unnecessary equipment,
3) Particularly unscrupulous donors may send under type of donations mainly faulty equipment. The considered examples show the results of making management decisions profit-oriented, with virtually no environmental performance are taken into account.

Note that even such decisions can be transferred to a neutral level by introducing as counterbalance the achievement of environmental indicators for the first of two examples. For example in the first of case , it is possible to organize the acceptance of failed equipment in order to further disposal either, or by selling company itself or by selling this waste to companies that are engaged in the purchase of such waste as raw materials for further processing. In the second case, it is possible for the donor company to receive tax preferences for philanthropy and reputation enhancement, in addition to reducing costs for recycling. An increase in environmental efficiency can be proposed similar to the first occasion. The third example suggests a solution that is likely to result in financial lass to the donor company, but will save its business reputation – this is the replacement of faulty equipment and its further disposal. Let us note the emerging trend for large companies, which are in favor of increasing environmental efficiency may make decisions that lead to lower profit. For example, according to the website DSnews.ua (2021), Apple announced its transition to consumption of only renewable energy for your needs from April 9, 2018.

Conclusions

The study results suggest that:

The introduction of environmental indicators into the management decision-making system makes it possible to reduce damage to the environment. In the examples discussed, this makes it possible to reduce environmental pollution by electronic waste containing hazardous compounds, such as compounds of mercury, heavy metals, lithium, cadmium, plastics, etc.

In the course of the study, many studies related to management decision-making through the prism of eco-efficiency were reviewed and analysed. The necessity of integrating environmental indicators into the management decision-making system is determined. The existing strategies for making managerial decisions are considered in detail. The main environmental factors that influence environmental efficiency are identified. As a result of the process, a general model of the interaction of economic and environmental indicators on management decision-making is proposed.

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National security and information in the early modern state: the case of Ukraine

Національна безпека та інформація в ранньомодерній державі: приклад України

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Abstract

The system of information support of the authorities of the Ukrainian early modern state, as well as implementing internal and external policies, contributed to protecting Ukrainian lands from external aggression and the expansion of Ukrainian interests in the world. The main purpose of the study is to analyze this statement. The methodological basis of the research is a comprehensive analysis of archival sources and historiography, which is based on the main principles of historicism and scientific objectivity. The scientific novelty of this publication is to prove the hypothesis that thoughtful information activity in its various segments was an important component of the policy of the Ukrainian early-modern state and contributed to protecting its lands and interests from foreign encroachments. Conclusions. Information activity was an important

Анотація

Система інформаційного забезпечення органів влади Української ранньомодерної держави, а також здійснення внутрішньої та зовнішньої політики сприяли захисту українських земель від зовнішньої агресії та поширенню українських інтересів у світі. Методологічною основою дослідження є комплексний аналіз архівних джерел та історіографії, що спирається на головні принципи історизму та наукової об'єктивності. Науковою новизною публікації є доведення гіпотези, що продумана інформаційна діяльність у різних її сегментах була важливим складником політики Української ранньомодерної держави, сприяла убезпеченню її земель та інтересів від чужинських посягань. Висновки. Інформаційна діяльність була важливим складником безпекової діяльності українського козацтва, засобом здійснення владної політики.

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component of the security activities of the Ukrainian Cossacks and a means of implementing power policy. The principles and approaches developed in working with information will help reveal the secrets of the Cossacks' information skills and will contribute to the deepening of interest in the study and revival of Cossack traditions, which is necessary both for filling research gaps and for training specialists in the field.

Keywords: information policy, Cossack Ukraine, national security, publishing, education.

Напрацьовані у той час принципи і підходи у роботі з інформацією допоможуть розкрити секрети інформаційної майстерності козаків, сприятимуть поглибленню інтересу до вивчення та відродження козацьких традицій, що є потрібним як для заповнення дослідницьких лакун, так і для підготовки фахівців галузі.

Ключові слова: інформаційна політика, Козацька Україна, національна безпека, видавнича справа, освіта.

Introduction

Being at the crossroads of the interests of the East and the West, the North and the South, Ukraine has always been and still is in a state of constant struggle for its security. The modern information society has revealed many existing problems in this area. Information wars have become harbingers and components of political, economic and, ultimately, military wars.

Under such conditions, the problems of the provision of society's vital activities, become of primary importance. The research is designed to find the details of the formation of Ukrainian information policy, state formation, establishment of a national mentality, and freedom-loving society, which is currently defending Ukraine and the civilized world from foreign encroachments.

The early modern Ukrainian state has been confronted with the insinuations and encroachments of its neighbors since its inception. The leaders of Kozak Ukraine developed and implemented a wide complex of non-public events aimed at safeguarding national interests. They created a powerful intelligence and counterintelligence system, which was one of the best during the XVI–XVIII centuries.

Taking care of the security of the homeland, the leaders of the Ukrainian early modern state and the wider circle of Cossacks obviously understood the importance of the humanitarian component in state building, grouping and self-identification of the Ukrainians of that time. The education of the population of the region not only contributed to the development of economic and military arts, but was also a factor in ensuring the proper existence and efficiency of the Ukrainian knighthood during a significant period of its history.

The object of the research is information policy as a security component in the times of the Ukrainian early modern state. The subject of the research is informational, in particular publishing, activity, the use of information and publishing works in state-building processes, with the aim of ensuring national security. We assume that well-thought-out information activity in its various segments was an important component of the policy of the Ukrainian state, contributed to its protection from foreign encroachments, and was an important part security activities.

The purpose of the study is to analyze and characterize the system of information support of the hetman power of early modern Ukraine, its influence on the implementation of internal and external policy, which contributed to the protection of Ukrainian lands from external aggression and the expansion of Ukrainian interests in the world.

The basis of an effective system for ensuring the proper functioning of state institutions and management is information. Ukrainian Cossacks knew how to obtain, form and use the necessary information, which ensured the existence in a hostile environment of both the sovereign Zaporizhia Sich and the broader Ukrainian early modern state, their successful implementation of politics and military-political actions for several centuries.

The study consistently shows the state of educational activity at that time, book publishing policy, the importance of proclamations, universals, letters in involving society in state affairs, the document circulation system, which ultimately led to the creation by Hetman Pylyp Orlyk of one of the first European constitutions, which substantiated the idea of Ukraine's independence, the declared goal of the

Cossacks is the liberation of Ukraine from the supremacy of Muscovy.

Literature review

Characterizing the degree of scientific development of the problems of the Ukrainian early modern state, we note that, focusing on the works of predecessors, modern researchers deepen and expand knowledge about modern Cossack upbringing, education and culture, which were important factors in the formation of the state construction and functioning of the Land of the Cossacks.

The works of Valery Stepankov (Stepankov, 2004), Viktor Brekhunenko (Brekhunenko, 2014), Oleksiy Putro (Putro, 2008), Ivan Syniak (Syniak, 2005) and Lubov Histsova, Liudmyla Demchenko, Tetiana Kuzyk, Larysa Muravtseva (Histsova et al., 2006), are devoted to the question of intelligence activity, in particular the informational component of it, the role of the leaders of the Cossack state in the development and implementation of security policy, including in the field of communication.

The issues of written communication, the training of Zaporizhia "chancellors", the functions and role of scribes, who were an important link in the power vertical, was considered in the works of, in particular, D. Yavornytskyi (Yavornytskyi, 1993), I. Syniak (Syniak, 2005), Yu. Mytsyk (Mytsyk, 1994) and other scientists. I. Syniak and V. Omel`chuk (Syniak, 2017) investigate the role of government in special, in particular informational, activities during the time of Hetman K. Rozumovsky. The security aspects of information policy are also discussed in the studies of Yu. Bondar (Bondar, 2017) and V. Shpak (Shpak, 2015).

Many scientists have focused on the study of the life activities of the leaders of the Ukrainian early modern state, in particular: Bohdan Khmelnytskyi (Stepankov, 2013; Krypiakevych, 1961; Storozhenko, 1996; Smoliy & Stepankov, 2003, etc.), Ivan Mazepa (Pavlenko, 2003; Mytsyk, 2007; Kovalevska, 2008, etc.), Pylyp Orlyk (Subtelny, 1981; Apanovych, 1993; Ivanchenko, 1993, etc.), Ivan Vyhovskyi (Kryvosheia, 2008; Yakovleva, 1998; Horobets, 2011, etc.), Peter Kalnyshevskyi (Hrybovskyi, 2004; Evarnitskiy, 1887; Putro, 2007, etc.) etc.
An attempt to generalize the main aspects of the formation and evolution of the Ukrainian state idea, which are considered in an inextricable connection with the struggle for its implementation during the 17th – 18th centuries made historians Valery Smoliy and Valery Stepankov (Smoliya & Stepankov, 1997).
The source analysis of the selected research topic shows the presence of certain works related to the information field, however, they are fragmentary, they consider either narrow time frames, or the activities of individual figures, or individual areas of life. The primary sources are archival materials, in particular the funds of the Central State Historical Archive of Ukraine in Kyiv, the Institute of Manuscripts of the National Library of Ukraine named after V. Vernadskyi, the Scientific Library of the National University "Kyiv-Mohyla Academy", etc. Important data are kept by letters, reports and denunciations of the Cossack foreman, the General Military Office and the Cossack scouts. Together, they make it possible to find out the importance and quality of written communication, as well as the role of Hetmans in the organization of military and intelligence operations, to establish the forms and methods of activity, in particular information, to clarify information about the role of information in the selection of personnel and in the organization of various events, as well as to reveal their effectiveness.

The vast majority of archival materials are located outside of Ukraine: in Poland, Lithuania, Sweden, russia, Germany, etc. The current situation does not allow them to be used to their full extent, but work on the topic continues, since there is no comprehensive study of the information policy of a once powerful state in the context of national security with emphasis on the existing problems of the 21st century.

Methodology

Source analysis is applied as a universal empirical method of researching regularities and specific features of the development of the information sphere, in particular, education and publishing, relying on, firstly, the letters, reports and denunciations of the Cossack foreman, the General Military Office, and Cossack intelligence officers, which make it possible to clarify the nature of the information activity at that time. Problem-chronological analysis was used in the reconstruction of the history of the development and formation of the foundations of the state information policy through the study of the activities of the leaders of the Cossack state, from Bohdan-Zinoviy Khmelnytskyi to Kyrylo Rozumovskyi.

The systematic method made it possible to investigate the evolution of the use of publishing products as a means of socialization, promotion of ideas and views, as well as a tool of information struggle, in the form of a holistic process that has a historical-progressive character. When considering the aspects of foreign policy regarding relations with Poland, Sweden, the Crimean Khanate, Russia, etc., the historical-comparative and analogies methods were used, when various elements of the information system were compared with corresponding foreign counterparts.

The historical-comparative method was used to compare the characteristics of various elements of the system with corresponding foreign analogues. The method of historical hermeneutics is used to reconstruct the attitudes and assessments of various social groups. Thanks to the method of cause-and-effect relationships, the dependence of the state of the national information field, in particular publishing and education, on the democracy of society, the influence of internal and external factors, and global processes was revealed.

The legitimacy of the research consists in the use as a primary source base of materials from the Central State Historical Archive of Ukraine in Kyiv and other archival institutions, as well as the preliminary work of Ukrainian and foreign scientists, which have already been tested by time.

Results and discussion

Cossack Ukraine was a country of literate people. Sources report that Zaporizhzhya Sich itself – a Cossack Christian state that existed for over a hundred years – had a kind of "book corpus" of several dozen books that every Cossack had to read. Zaporozhians read the Holy Scriptures, spiritual books, many of the soldiers knew not only Ukrainian, but also Polish, Tatar, and Turkish languages, could be translators, and knew the art of negotiation. There were schools and workshops for the production of books that contained the acquired knowledge in Khortytsia and other Cossack settlements.

Important evidence about Cossack Ukraine are the travel notes of the Syrian archdeacon-historian Paul of Aleppo (Halebsky) "Travel of the Patriarch of Antioch Macarius", handwritten lists of which are kept in London, Paris, St. Petersburg and Kyiv. (In Kyiv, the manuscript of the notes is kept in the archive of Professor O. Pritsak in the Scientific Library of the National University "Kyiv-Mohyla Academy" (Halebskyi, 1650). The manuscript appeared in Ukraine thanks to the efforts of Agathangel Krymsky, who acquired it during his trip to Syria in 1896). The author made a trip as part of the patriarchal delegation, the official purpose of which was to establish and strengthen religious and political ties, and the route of which in 1654–1656 ran from Damascus through Ukrainian lands to the Muscovite Empire.

Travel notes contain information about the political and economic situation in the lands visited by the deputation, customs, culture and lifestyle of the local population. Starting from Rashkov and throughout the Hetmanate, the participants of the trip noticed the general ability to read and write, even among women, children, even orphans, knowledge of church service and hymns (Hrushevs'kyj, 2015, p. 429). The fascination of Aleppskyi causes by the education of the nuns of the Ascension Monastery, who are all "not only literate, but even highly learned...". About the abbots in Kyiv monasteries, he says that among them there are "human scientists", experts in law, philosophers and eloquent speakers (Arkas, 1994, p. 188).

Aleppskyi connects the large number of literate people in the "Land of the Cossacks" with the statist policy of B. Khmelnytskyi, whom he met twice during his travels (in 1654 in Bohuslav and in 1656 in Chygyrin).

The Danish ambassador under Peter the Great, Justus Julius, confirms Aleppskyi's impressions. Returning home through Ukraine, he writes: "Inhabitants of Cossack Ukraine live happily, do whatever they want... They go to church with prayer books in their hands, while among the Muscovites, not even the boyars are literate" (Arkas, 1994, p. 188).

Travelers emphasized the development of publishing in the Land of the Cossacks. Thus, after visiting the Kyiv-Pechersk Monastery, Pavlo Aleppskyi noted: "Near the Church of the Assumption of the Virgin, there is a beautiful printing house that serves the whole country. All the church books come out here - beautifully printed, in different declensions and in different colors. Also drawings on large papers – views of regions, images of saints, scientific research and so on (Khalebskyi, 1995, p. 66; Arkas, 1994, p. 188). Here Aleppskyi mentions the printing house founded in 1615 on the initiative of the abbot of the Kyiv-Pechersk Monastery of the Assumption of the Holy Virgin, the energetic administrator E. Pletenetsky, who, by the way, came from the Galician Cossack family: Pletenetskyi's father was the elder of the registered Cossacks, and the future archimandrite himself, according to some sources, was also a Cossack until he was ordained a monk. Around the fraternity and the printing house gathered writers, cultural figures who formed, according to I. Ohienko's expression, the "Printing Academy". All the academicians got along well in the printing business (Ohiienko,1994, pp. 407-410).

The publishing policy of the heads of the printing house had a distinct Ukrainian national character and was aimed at the spread of Orthodoxy, which was relevant in the light of the confrontation with Catholicism and Uniatism. Academicians insisted on the use of the living Ukrainian language ("common conversation") in church services, "because it is necessary for the word to be understandable, to "edify", to be accepted by the mind, and not only by the tongue", which was also embodied in the publishing house (Hrushevs'kyj, 1996, pp. 48-49). The Cossack theme was also present in the publishing repertoire of the printing house. In such works as "Poems for a pitiful burial... of Pyotr Konashevich-Sagaidachny" from 1622 (Sakovich, 1992, p. 160-183) (or "Eucharysterion", published in 1632 (Pochasky, 1992, pp. 222-250), the Zaporozhian Cossacks were glorified as a model of courage and patriotism.

Cossacks contributed to publishing, and were publishers themselves. As, for example, T. Verbytskyi, a "comrade of the Zaporizhzhya Army", a wealthy Kyiv burgher and former employee of the Lavra printing house, who, with the financial assistance of Metropolitan Y. Boretskyi, purchased in September 1624 from the family of another Zaporizhia Cossack, Y. Putivlts, "that at that time "Behind the thresholds" was located, for a respectable sum of 200 Lithuanian kip" a yard with a house in Podil, where he set up his "printing house". The first book of the new publishing house was "Chasoslov", later "Bukvar" and "Psalter" were published. Verbytskyi intended to expand the possibilities of the printing house, for which he went to Ostroh, who immediately heard rumors about a "Zaporozhian printer" who wanted to buy the remaining equipment of the local printing house. The trip was not entirely successful – the local landowner L. Buchaisky imprisoned the guest, after which he was sent back to Kyiv with nothing. Later, on behalf of P. Mohyla, Verbytskyi went to Voloshchyna, where he organized a new printing house in Dovhoy Pol (Hrushevs'kyj, 1996, p. 46; Ohiienko, 1994, pp. 407-410).

Noting the broader context of the national movement superimposed on the age of the Cossacks (Y. Isaievych drew attention to the fact that important events in the history of Ukrainian book-writing and printing coincided with milestone events of the Cossacks (Isaievych, 2004. p. 932)), it is worth noting the fraternal movement – the creation of schools in different Ukrainian lands, where the national elite who personified the Ukrainian Renaissance. The first fraternal school was established in 1586 in Lviv. In the following years, such schools were founded in Sambor, Horodok, Przemyśl, Lutsk, Stryi, Nemyrov, Vinnytsia, Kamianets-Podilskyi and other cities and villages. They were founded so that young people "draw knowledge from native sources"(Khyzhniak, 2004, p. 754). "Brothers" purposefully carried out the propaganda of patriotic views, using various measures and means, primarily publishing, to form a national worldview among the widest circles of compatriots. The Cossacks also stood near the origins of the Kyiv fraternal school – the predecessor of the Kyiv-Mohyla Academy, whose students formed the basis of the "educated class" of military clerks, from which many writers, translators, and historians emerged.

Thanks to the efforts of educators, education has become, in the opinion of Z. Khyzhniak, a component of the mentality of Ukrainians (Khyzhniak, 2004, p. 765). In the 17th century the majority of Ukrainians (approximately 60%) were literate. Schools existed in cities, towns, villages, at large monasteries and churches. Higher schools were also founded in Kyiv, Kremenets, Vinnytsia, Gosh and outside Ukraine, in particular, a school and a printing house in Iasy (Moldova) and others cities (Palij, 2013, p. 766; Khyzhniak, 2004, p. 765). The Cossacks took care of providing schools with the necessary literature. So, for example, in 1760, Colonel Ivan Kulyabka from Luben ordered two thousand primers from Kyiv publishers for the education of Cossack youth (Kahamlyk, 2008, p. 192).

One of the most popular in the 17th–18th centuries. there were historical works that were distributed mainly in manuscript. Currently, memoirs are also interesting, in particular the so-called Lviv Chronicle, Samovidets Chronicle, diaries, numerous chronographs and chronicles, including the Cossack chronicles and diaries of Samiyla Velichka, Hryhoriy Grabyanka, Samiyla Zorka, Yakov Lyzoguba, and others. Researchers also pay attention to the formation during the 17th century. of the dum genre – a heroic historical epic that combined book and oral elements. Dumas were in the active "propaganda" arsenal of kobzars, which became a certain symbol of Cossack culture, entering the corpus of the so-called Ustyn books – collections of folklore and other works that were transmitted orally (Martynova, 2003, p. 305).

Cossacks and "leaflet communication" were actively used. As early as 1625, written appeals were spreading in Zaporizhzhya Sich, which spoke about the tasks of the Ukrainian liberation movement, in particular, in the matter of opposing the crown army (Scherbak, 2004, p. 20-31). Researchers are also talking about a "proclamation war". On the eve of the next stage of the Russo-Swedish war, after the anathema of I. Mazepa, the tsar, writes M. Arkas, sent two manifestos to the Ukrainian people. In one respect, the monarch flattered the Ukrainians so that they would not believe the manifestos and universals of Charles and Mazepa, because, they say, there is not a single people in the whole world who live as easily and freely as the Ukrainians under the hand of Moscow; in the second, the king promised not to punish anyone for not informing about Mazepa's intentions to go over to the Swedes. Peter I urged Ukrainians not to be afraid to return to their property. Those who will not obey, the king will consider traitors and will take away their positions, signs and property, punishing them with death, and their women and children will be sent into exile... About the letter to the Cossacks from clergymen, written on the instructions of Peter I, says V Serhijchuk (Serhijchuk, 2016, p. 161).

I. Mazepa also joined the information war, sending out circulars where he explained the reasons that forced him to go against Russia. "Moscow, he wrote, wants to devastate the cities, enslave all the elders, turn the Cossacks into dragoons and soldiers, drive the people to the Moscow lands across the Volga, and populate our region with their own people." In the same way, the colonels – supporters of Mazepa, who called to disobey the tsarist manifestos and support the Hetman – distributed pamphlets. Swedes also spread their appeals in Ukraine, printing appeals to Ukrainians on a Russian printing press that happened to be in their possession. In the postcards, the Swedish king assured the Ukrainians that he had no intention of doing evil, but wanted to free them from the Moscow yoke, and also advised them to obey Hetman Mazepa. Enraged by such proclamations, Peter I even issued a decree not to believe the prints and not to keep them, and to detain and deliver those who distribute leaflets to Moscow, for which "royal mercy" was promised (Arkas, 1994, p. 295-296; Butych, 2006, p. 411-413).

Proclamations were also used during the Haydamak movement, evidence of which has been preserved in foreign intelligence documents. Polish sources, currently researched by E. Buket, report that from the middle of the summer of 1768, after the capture of Colonel M. Zalizniak by the Moscow army near Umannaya, proclamations were spread on Ukrainian lands, which stated that "...a Muscovite is an enemy of the people, so you should not serve him, because only by freeing yourself from him, you can get unlimited freedom." (Butych, 2004, p. 222; Rolle, 1966, p. 20). Leaflets with a similar content, distributed in the territories where I. Bondarenko (under the signature "Cossack Ivan"), Ya. Sachenko, S. Maiboroda, M. Guba and other insurgents were active, were quite effective and intensified the insurgent struggle (Omel`chuk & Sinyak, 2017, p. 245).

Book collections testify to the place of books in the life of Cossack Ukraine. Large libraries were formed at educational institutions and printing houses in Ostroh, Lviv, Lutsk, Chernihiv, Kharkiv, Nizhny... The book collection of the Kyiv-Mohyla collegium was famous for its collection, where, according to various sources, more than 12,000 editions of different times and countries were collected. The special storage archive consisted of handwritten works – lecture notes, chronographs, diaries, as well as various business documents. The library and archive could be used not only by teachers and students of the academy, but also by anyone.

Monasteries and churches had their book collections. Thus, according to the description from the 18th century, the Intercession Church of Nova Sich had 120 books of various contents - from liturgical to historical. Often patrons of such gatherings were the Cossacks themselves. In the library, for example, of the Samara Desert-Mykolaiv monastery, there were publications donated by the chief of the Velichkiv kuren D. Miria, the Cossack Biletsky, the last chief of the Kosh P. Kalnyshevsky, etc. (Arkas, 1994, p. 333-334; Isaievych, 2004, p. 933; Khyzhniak, 2004, p. 768).

Separately, we can talk about private Cossack book collections of the XVII–XVIII centuries. For example, according to sources, the estate of General Military Judge G. Myloradovych contained 16,000 books, the Bunchuk comrade of the Starodub Regiment S. Lukashevich had 12,000 books, Colonel V. Kochubey in Zhuky in

Poltava region had 5,000 books etc. One of the largest and most sophisticated libraries was collected by I. Mazepa in Baturyn. Remembering her, the General Scribe, and later Hetman of the Zaporozhian Army in exile, P. Orlyk wrote: "...Precious frames with Hetman coats of arms, the best Kyiv editions, German and Latin incunabula, many illustrated ancient chronicles. Not without sighing, in my current poverty, I remember all the book riches, which were unmatched in Ukraine...". The "Peresopnytsia Gospel" was known among the hetman's gathering. M. Khanenko, the General Military Coroner in 1741–1760, had a large collection of various publications. According to stories and personal diaries, he always had books with him that he read on the road, and the main library was set up in one of his estates, let's say in Horodysh. Books, according to the author of the notes, were an important element of his communications as well – Khanenko often gave publications and exchanged them (Tytova, 1896, p. 151-196).

The aforementioned scribes occupied a place of honor in Cossack Ukraine. Prominent state and political figures came from among scribes. So, the scribe was the first official Hetman of the Zaporizhzhya Army, B. Khmelnytskyi. I. Vyhovskyi, who researchers consider the founder of the Ukrainian secret service, began his state ascension as a personal, "private" scribe of the Hetman. He spoke several languages, was an excellent calligrapher, co-author of important universals of B. Khmelnytskyi, and "often wrote them himself at the behest of the hetman." In 1650, Vyhovsky was appointed Military Clerk, which position he "turned into the most influential in the Ukrainian government" (Zhytar, 2009, p. 83; Kovalenko, 2007, p. 56).

Already after the death of Khmelnytskyi's patron and friend, Vyhovskyi was elected Hetman by the decision of the Chigyryna September Council in 1657. In the future, Vyhovskyi continued to take care of the information sphere, including the Cossack publishing house. This is evidenced, in particular, by the articles of the Hadiac Treatise signed by him with Poland in 1658. It stipulates that in Ukraine "colleges, schools and printing houses, as many as they are needed, can be freely founded, freely engage in science and print various books" (Khyzhniak, 2004, p. 754). One of the steps of the former scribe's rule was the termination of the alliance agreement of 1654 between Ukraine and the Muscovite kingdom, which led to a war with the Muscovites and the removal of Vyhovsky from power, and later to his murder.

The Hetman of the Zaporizhzhya Army in exile, a graduate of the Kyiv-Mohyla Academy, P. Orlyk, who began his rapid career in 1690 as the cathedral scribe of the Kyiv Metropolitanate, and then in the Poltava Regiment, also tasted Pisarsky bread. A capable young clerk attracted the attention of the Hetman of Zaporizhzhya I. Mazepa, who in 1702 became the godfather of Orlyk's eldest son, Hryhor. Soon P. Orlyk assumed the post of General Clerk of the General Military Office. Loyal to Mazepa until the end of his days, Orlyk continued the cause of the Hetman, becoming the leader of the first Ukrainian political emigration and the organizer of Ukrainian liberation struggles. After the election of the Hetman of the Zaporizhzhya Army in April 1710, Orlyk published the famous "Pacts and Constitutions of Laws and Freedoms of the Zaporizhzhya Army" in Bendery (Orlyk, 2006, p. 5-25). In one of the first European constitutions, the idea of Ukraine's independence, the persistence of the Ukrainian state-building process, and the declared goal of the Cossacks – the liberation of Ukraine from the supremacy of Muscovy – were substantiated.

Under P. Orlyk, for the first time since the time of B. Khmelnytskyi, the Ukrainian issue was placed at the epicenter of European politics on the international arena, and an international front of support for Ukraine's aspirations was created. One of the important works that attracted the attention of the community was the manifesto to the European monarchs "Excerpt of the Rights of Ukraine", probably written in 1712. In the treatise, Orlyk outlined his vision of Ukrainian-Russian relations, pointing out the inexorable absorption of the Cossack state by Russia. Calling on European governments to support Ukraine in its quest for independence, the author warned that if the Europeans do not interfere in negative processes, the invasion of the Russians may eventually spread to other countries, that is, it is about the security of states (Matiakh, 2004, p. 444-447).

The Ukrainian word was dangerous for those who wanted to rule Ukraine. And that is why the Muscovites, seeing it as a threat to their rule, limited it in every possible way – politically and administratively – by banning and repressing it, subjecting it to censorship (Andrievsky, 1888, pp. 61-63). Thus, after the destruction of first Zaporizhzhia, and then the Pozaporizchi sichs, all property and archives of the Cossacks were taken to Russia, as a result, many cultural assets of Cossack Ukraine, including book works, were lost. With the actual loss of the Ukrainian book, the Ukrainian society ultimately lost its statehood, being on the verge of denationalization.

Conclusions

Ukraine is an ancient state with a rich and majestic history, however, more than 300 years of being under colonial Russian oppression actually erased the true history of their people from the public information flow of entire generations of Ukrainians. Practically all available achievements were kept silent by the metropolis, and archival materials were either destroyed or are inaccessible even to the scientific community. The desire to destroy Ukraine and the Ukrainian people remains a dream of the imperial metropolis to this day.Studies of the history of the Cossack state are based mainly on the found foreign archival materials of Warsaw, Krakow, Stockholm, Munich, etc. and the priceless treasures of the national archives that have been preserved.

During the days of the Ukrainian early modern state, the foundations of the vision of the state information policy, focused on ensuring national interests in various spheres of life, were formed. A well-thought-out information policy, the position and participation of the leaders of Cossack Ukraine in information processes contributed to securing national interests and protecting the state from foreign encroachments.

Publishing was important for Ukrainian superiors. The publishing centers of Cossack Ukraine were numerous monasteries, churches and other religious institutions where printing houses were organized. A prominent place among such publishing centers, often initiated by Cossack elders, belongs to the printing house of the Kyiv Lavra, which, having absorbed the achievements of other Ukrainian publishing schools, as well as the experience of publishing houses of the European Renaissance, for many years became the most powerful publishing center of its time, a trendsetter in Ukrainian publishing. having determined the direction of its development.

Literary writers, leading figures of education and culture gathered around the publishing centers, who understood publishing, including as a means of establishing Ukrainianness and statehood. Representatives of the Cossack community not only took care of the protection and development of the Ukrainian publishing industry, but were often themselves skilled publishers-practitioners who enriched literature with original works about the achievements of Ukrainians, contributed to the spiritual development of readers, the formation of national consciousness and the formation of the Ukrainian "educated state".

In the times of the Cossacks, a wide network of schooling and higher education emerged, various sciences and arts - philosophy, literature, linguistics, etc. - developed and spread. The so-called fraternal movement and, in particular, fraternal schools, which became the centers of education of the national elite and, more broadly, the Ukrainian national worldview, with the help of enlightenment and publishing activity, wrote their distinctive page in the development of the publishing house of Cossack Ukraine.

Evidence of a respectful attitude towards books in the days of Cossack Ukraine are numerous libraries and archives that were formed at various institutions, educational institutions, printing houses and were centers of enlightenment. The leaders of Cossack Ukraine also left behind rich book collections, testifying to the respect for books and the high education of Ukrainians of that time. The education of Ukrainians during the time of the Cossacks was also manifested in the institute of scribes, which were an important link in the system of state and public administration and from which outstanding Ukrainian statesmen emerged.

The publishing practice of Cossacks provides examples of the use of publishing products as a means of socialization, promotion of ideas and views, as well as a means of informational struggle. Such use of the publishing house is typical, in particular, for the periods of the unfolding of the national liberation struggle of the 17th and 18th centuries, during armed confrontations, when propaganda products were an element of the "information war" and were used to attract supporters to one's side and for discredit the opponent.

The cultural achievements of Cossack Ukraine and subsequent times were subjected to the destructive influence of imperial Muscovy, which pursued a policy of Russification, persecuting independent expressions of national culture in every possible way. During the entire period of domination over the Ukrainians, Russia did everything possible to take away, or at least blunt, their weapons against enslavement - the national word and publishing house.

However, Ukrainians found the strength to avoid the national death that seemed to be looming over them. Historical justice consisted in the fact that it was the "semantic code" of the Cossacks that became the lever of a new rise of the Ukrainian spirit, which sought liberation from the imperial desire to subjugate Ukrainians mentally by "dissolving" them in the empire, including with the help of information policy.

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Cultural aspects of model formation of socio-economic development in eu regions: a comparative analysis

КУЛЬТУРНЫЕ АСПЕКТЫ ФОРМИРОВАНИЯ МОДЕЛИ СОЦИАЛЬНО-ЭКОНОМИЧЕСКОГО РАЗВИТИЯ РЕГИОНОВ ЕС: СРАВНИТЕЛЬНЫЙ АНАЛИЗ

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Abstract

The article reveals the actual problem of cultural influence on the socio-economic development of the regions in the European Union. The research goal is to compare socio-cultural differences, which are significant factors for determining the vectors of socio-economic development of European countries. The article presents the results of an empirical study of the cultural components of regional models of socio-economic development on the example of some countries of the European Union.

The research materials were official statistics and expert assessments obtained as a result of a survey of specialists from various academic research structures on the social network Twitter. The total number of respondents from 9 European universities was 900 people.

The research methodology is based on a socio-cultural approach, includes the methods of the general scientific group and of special methods: historiographic analysis of scientific literature on the research topic, the method of comparative analysis, the method of sociological survey, statistical analysis, quantitative and qualitative research methods.

Based on the empirical study, the following results were obtained: as the main cultural components that determine the specifics of the socio-economic development of the EU regions, the experts identified the historical context, national mentality, as well as value attitudes of behavior.

Key words: models of development of EU regions, regional economy, sustainable

Аннотация

В статье раскрывается актуальная проблема культурного влияния на социально-экономическое развитие регионов в Европейском союзе. Целью исследования является сравнение социокультурных различий, которые являются значимыми факторами для определения векторов социально-экономического развития европейских стран. В статье представлены результаты эмпирического исследования культурных компонентов региональных моделей социально-экономического развития на примере некоторых стран Европейского союза. Материалами исследования послужили официальная статистика и экспертные оценки, полученные в результате опроса специалистов различных академических исследовательских структур в социальной сети Twitter. Общее количество респондентов из 9 европейских университетов составило 900 человек. Методология исследования основана на социокультурном подходе, включает методы общенаучной группы и специальные методы: историографический анализ научной литературы по теме исследования, метод сравнительного анализа, метод социологического опроса, статистический анализ, количественные и качественные методы исследования. На основе эмпирического исследования были получены следующие результаты: в качестве основных культурных компонентов, определяющих специфику социально-экономического развития регионов ЕС, эксперты выделили исторический контекст, национальный

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development, socio-economic differences, culture of European countries.

менталитет, а также ценностные установки поведения.

Ключевые слова: модели развития регионов ЕС, региональная экономика, устойчивое развитие, социально-экономические различия, культура европейских стран.

Introduction

The topic relevance lies in the fact that the economic development of the European Union remains uneven and includes a number of problems that have yet to be solved. The researchers note that one of the most serious problems of European integration is that different regions of the EU implement different economic models. On the one hand, this enriches the economic policy due to the presence of different approaches to economic policy, and on the other hand, it hinders the development of a common policy on many issues (Bakry, 2023a, p. 189).

At present, it is customary to distinguish the following main modeling characteristic of the EU regions.

1. In Western Europe, the German model and the French model of development stand out. The economic (more precisely, socio-economic) model of post-war Germany was formed under the influence of several areas of scientific thought: the liberal Freiburg School, social liberalism and neoliberalism. In this model indicators of state activity in the economy are quite moderate by European standards. In recent years, the state quota (total expenditures of the federal, land and local budgets in relation to GDP) has fluctuated in the range of 45-46% of GDP (Groth, 2022, p. 22). The public sector employs about 15% of the working-age population, and the total tax quota (taxes, fees and social contributions) is at the average European level and amounts to about 40% of GDP (UNCTAD, 2023b). A special place in the economy is occupied by small and medium-sized businesses, whose contribution to the country's GDP is about 54%, they employ 58% of workers (UNCTAD, 2023a). Germany is one of the few developed countries that has retained a significant industrial sector in the economy. Its share in the structure of GDP is 25-26% (without construction). Key industries: machine-building complex (primarily automotive), chemical complex (including pharmaceuticals). The German economy has a pronounced export-oriented character. The export quota for goods is 39% of GDP, and together with the export of services - 47.5% of GDP. In a number of key industries, the share of exports reaches 70% or more (UNCTAD, 2023a). The German economy demonstrates exceptional resilience, the country remains the leading economy of the EU (21% of its GDP) (UNCTAD, 2023b).

Unlike Germany, the specificity of the French model is the traditionally high role of the state in the economy and social sphere. France is among the countries with a very high level of human development, ranking 27th in the world, according to UNCTAD (UNCTAD, 2023b). The key problems of France's economic development remain the chronic state budget deficit (since 1975, the budget has never been reduced to a surplus, the deficit peaked in 2009 (7.2% of GDP) and in 2022 amounted to 3% of GDP) and the increase in public debt: 59 and 98% of GDP in 2000 and 2022, respectively (UNCTAD, 2023b). In the social sphere, one of the main problems is the aging of the population (in 2022, the share of people over 65 in the total number of inhabitants reached 22%), which leads to a deterioration in the demographic burden ratio of the older generation (32.5 in 2022 versus 24.3 and 25.6 in 2000 and 2010, respectively) and creates certain difficulties in the context of the crisis of social policy in the country (UNCTAD, 2023c). Another social problem is mass unemployment (8.5% in 2019, one of the highest rates in the EU), with a consistently high unemployment rate among those under 25 years of age - 20% of the population (UNCTAD, 2023b).

2. Southern Europe is represented by the model of economic development in Italy and Spain. The Italian economic system is characterized not only by economic pluralism, the combination of private and public property, but also by active state regulation, mainly through indicative planning. Italy is still characterized by regional disparities between the rich north and the catching-up south and, as a result, acute social contradictions and problems remain. About a third of the labor force is

concentrated in the south, but unemployment is more than 20% (more than 50% for young people) (UNCTAD, 2023b). As in other EU countries, Italy's economy is largely export-oriented. The Spanish model is characterized by a relatively low role of the state for European countries (public spending in 2022 amounted to 43% in relation to GDP versus 58% in France) (UNCTAD, 2023c).

The Spanish economic model is also characterized by the predominance of micro, small and medium-sized enterprises, which employ almost 72% of the workforce (including 41% in microenterprises), which is significantly higher than the EU average (UNCTAD, 2023b). Thus, small business face a number of difficulties: they do not receive sufficient government support, have problems with entering the markets of other EU countries, and also lag behind companies from other EU countries in terms of internationalization. Spain lags far behind European leaders in the field of high technology, which may be due to the fact that R&D spending is insufficient, it amounts to 1.2% of GDP, while the EU average is 2% (UNCTAD, 2023a). As a result, Spain traditionally lags behind the EU as a whole in terms of the share of high-tech exports in total industrial exports – 7% versus 16% (26% in France) (UNCTAD, 2023a).

3. The socio-economic models in the countries of Eastern Europe are characterized by a combination of institutions of the liberal (Anglo-Saxon) economy, the institutions of the market economy (as in many countries of continental Europe) and the institutions of the socialist period that have been preserved in a modified form. Contrary to the expectations of the population that the first post-socialist governments in the CEE countries would contribute to the formation of a corporatist model of relations between labor and capital, similar to Western European countries, the labor market was farmed out to large TNCs (Bakry, 2023b, p. 106). Foreign investors were supporters of the deregulation of labor legislation following the experience of the Anglo-Saxon states and the individualization of labor relations.

As a result, the economic systems that have developed in them have become largely an institutional hybrid model. In the countries of Eastern Europe, corporate governance is built primarily on the basis of the relationship between the heads of local branches and their headquarters, while local managers have limited powers: they can independently make decisions in the field of operational management, but strategic decisions are made in parent companies.

Another common feature of the economic models of Eastern European countries is the dominance of foreign capital in the economy. A specific feature of these models is economic development based on the borrowing of technologies. Within the framework of the above-described regional model, there are varieties. Among them, several can be conditionally distinguished: the model of the Baltic countries, the model of Hungary, Poland, Slovakia, the Czech Republic and the model of Slovenia (UNCTAD, 2023c).

Literature review

All of the above data suggest that the regional development of the EU is heterogeneous, which is associated not only with historical, demographic, geographical and geopolitical factors, but also with the cultural characteristics of the countries of Western, Southern and Eastern Europe. Meanwhile, the study of the cultural aspects of the socio-economic development of the EU countries will reveal not only material, but also subjective, cultural aspects that can have both positive and negative impact on economic development (Labianca, 2020, p. 1803).

Among the cultural aspects influencing the socio-economic development of the EU countries, researchers identify the following factors:

– mentality (Vogel and Will, 2023, p.47);
– historical context (Thatcher, 2019, p. 128);
– value behavioral attitudes (Serban et al., 2023, p. 420).

We take these aspects as criteria for comparative analysis in the empirical part of the study.

The historiography is quite extensive, but mainly focused on mathematical models and economic factors in the development of EU regions, taking into account some cultural differences. Thus, the theoretical aspects of regional development models in the EU are considered in the works by such authors as D. Soto-Oñate, G. Torrens (2022), V. Omelyanenko, O. Omelyanenko (2019), J. Premović, L. Arsić (2020), M. Proskurina (2022), B. Salikhov, I. Salikhova

(2022), I. Schäfer, Y. Khoudja, D. Grunow (2022).

Of methodological interest are the works by M. Jagódka & M. Snarska (2022), T. Juric (2023), M. Kruse, C. Somcutean, J. Wedemeier (2023), O. Labianca (2020), E. Mamatzakis, L. Neri, A. Russo (2023), T. Marzal (2023), since they present a matrix analysis of the economic models of EU development, a comparative analysis of cultural factors of regional development, etc.

At the same time, in the empirical works by L.H. Anders (2023), A. Bakry (2023a, 2023b), R. Brandtjen (2023), S. Ferran-Vila, G. Miotto, J. Rom-Rodríguez (2022), Garashchuk, Castillo, Rivera (2023), S. Groth (2022), R. Higgott (2020), the main emphasis is on the study of formal macroeconomic indicators, without taking into account the socio-cultural factors of regional development in the European Union.

Meanwhile, in the works by such authors, it is argued that a number of cultural aspects that distinguish the mentality of Western, Southern and Eastern Europe are the basic cultural invariant for modeling socio-economic development.

Thus, the study of the cultural influence on the socio-economic models of the development of the EU regions will significantly supplement the existing historiography, as well as make a certain contribution to the scientific development of the general problem of the correlation between culture and the economy.

Materials and methods

The research materials were expert assessments obtained as a result of a survey of specialists from various academic research structures in the EU. The survey was conducted on the social network Twitter.

The total number of respondents was 900 people. Of these, a representative sample of 90 people was formed by the method of mechanical sampling (according to the principle of every tenth), divided into three expert groups of 30 people from 9 European universities.

A questionnaire was created for them with questions, the answers to which clarified the position of experts on the impact of cultural components on the socio-economic development of the EU regions.

Table 1.
Distribution of respondents according to the criteria of European regions and academic institutions.

University and region	Respondents' number
Western Europe	**1 expert group**
Akkon Graduate School for the Humanities (Germany)	15
Faculty of Humanities Sorbonne (France)	7
Ghent University (Belgium)	8
South Europe	**2 expert group**
International University of Languages and Media (Italy)	9
Autonomous University of Madrid (Spain)	6
Greek Open University (Greece)	15
Eastern Europe	**3 expert group**
State Eastern European University in Przemysl (Poland)	8
Eötvös University of the Humanities (Hungary)	8
Transylvanian University of Brasov (Romania)	14

Experts assessed the problem of the main cultural aspects on the models of socio-economic development in the EU countries. As a result, it was possible to identify common cultural aspects and transform them into three criteria: national mentality, historical context, and value attitudes of behavior.

The research methodology is based on a socio-cultural approach and includes the methods of the general scientific group (analysis, synthesis, induction, deduction), as well as a number of special methods: historiographic analysis of scientific literature on the research topic, the method of comparative analysis, the sociological survey (method of expert assessment, questionnaires), statistical analysis, quantitative and qualitative research methods.

Table 2.
Research methods by groups and research objectives

Method group	Research objectives
General scientific methods	Scientific synthesis of the information received Research of scientific literature on the research topic
Special methods	Sociological research, Statistical analysis survey results Quantitative and qualitative research methods.

For processing 90 questionnaires with survey data we used a special program Neural Designer, a tool for advanced, predictive and prescriptive analytics. All qualitative data (respondents' answers) were translated into quantitative format.

Table 3.
Criteria for the influence of cultural aspects to the socio-economic development in EU regions

Criterion	Framing expert review
The national mentality impact on regional economic model	Expert assessment with comments on effect (positive / negative)
The historical context impact on regional economic model	Expert assessment with comments on effect (positive / negative)
The value behavioral pattern on regional economic model	Expert assessment with comments on effect (positive / negative)

Experts analyzed the impact of cultural aspects on the regional development models in the EU countries, giving their comments on what kind of effect such an impact gives - positive or negative. These comments were reflected in the questionnaire as additional information, which made it possible to identify in more detail the experts' position on each of the criteria (Table 4).

Table 4.
Methodology for assessing the criteria of problems in two categories

Criterion	Rating scale
National mentality	1-3 low level
Historical context	4-6 average level
Value behavioral attitude	7-10 high level

All three criteria were evaluated by experts on a 10-point scale, according to the increasing influence of a particular cultural aspect on the model of socio-economic development in each region: 1-3 low level, 4-6 medium level, 7-10 high influence level. The empirical study consisted of three stages: 1) preliminary stage; 2) the main stage; 3) analysis of the results (Table 5).

Table 5.
Timing and content of the stages of empirical research

Research stage	Stage content	Timing
Preliminary stage	Negotiations with potential respondents regarding participation in the study. Formation of a representative sample and formulation of the questionnaire.	1-12 February 2023
Main stage	Conducting a survey on the social network Twitter, collecting expert answers.	14 March 2023
Analysis of results	Analyzing results using a statistical Neural Design program	22 March - 18 April 2023

The empirical study was conducted from February 1 to April 18, 2023. The results of the empirical study are shown below.

Results and discussion

Based on the results of a survey in the first group of respondents from universities in Africa and Europe, the following results were obtained (Figure 1).

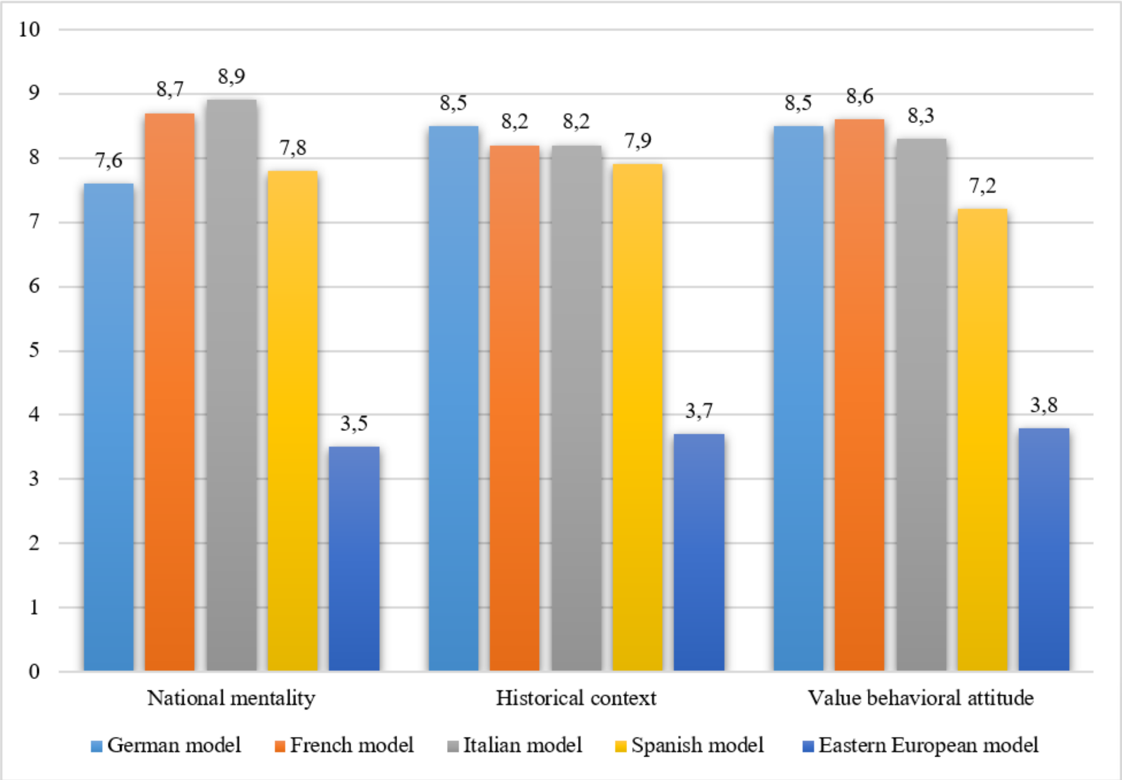

Figure 1. Assessment by 1st expert group of cultural components' influence on models of socio-economic development
(compiled by the author using the Neural Designer program)

As can be seen from the data shown in Figure 1, the experts in the first group (Western European universities) highly appreciated the level of influence of all three components on the models of socio-economic development in Western European countries, except for Germany, as well as on the countries in Southern Europe. According to experts, the mentality and historical context are less important than value behavioral attitudes for the German development model.

At the same time, the experts noted the moderate influence of the cultural context on the socio-economic development of Eastern Europe, arguing that the region was characterized by a «historical trauma of socialism» and a «painful exit from the socialist economy to a new market model».

Similar results were obtained in a survey of the second group of respondents from universities in Southern Europe (Figure 2).

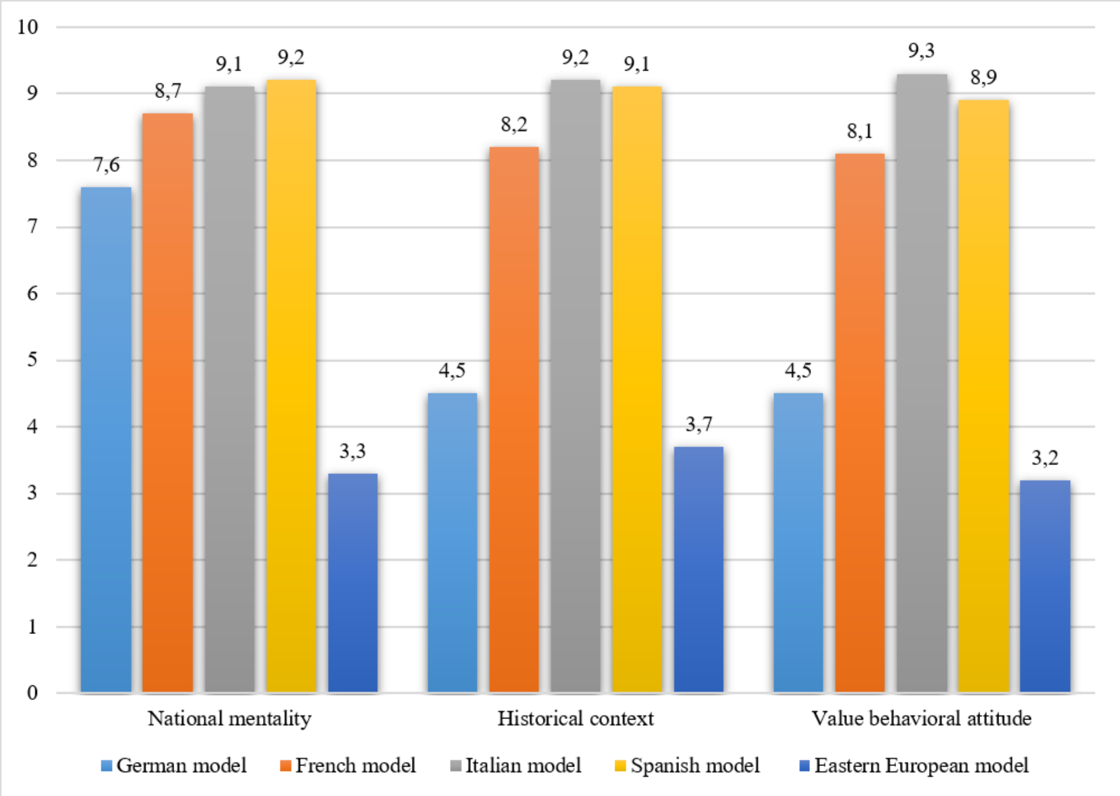

Figure 2. Assessment by 2nd expert group of cultural components' influence on models of socio-economic development
(compiled by the author using the Neural Designer program)

As can be seen from the data in Figure 2, experts from the Southern European Universities rated at a high level the influence of all cultural components on the models of Western Europe (including Germany) and on the models of Southern Europe. According to experts, cultural aspects have a moderate influence only on the countries of Eastern Europe.

On this, the two groups of experts were in complete agreement. However, in this group, no explanation was given for the position why cultural components have a moderate influence in Eastern Europe. According to experts, cultural influence is most high in the models of Western and Southern Europe.

Opposite results were obtained in the third group of respondents from universities in Eastern Europe (Figure 3).

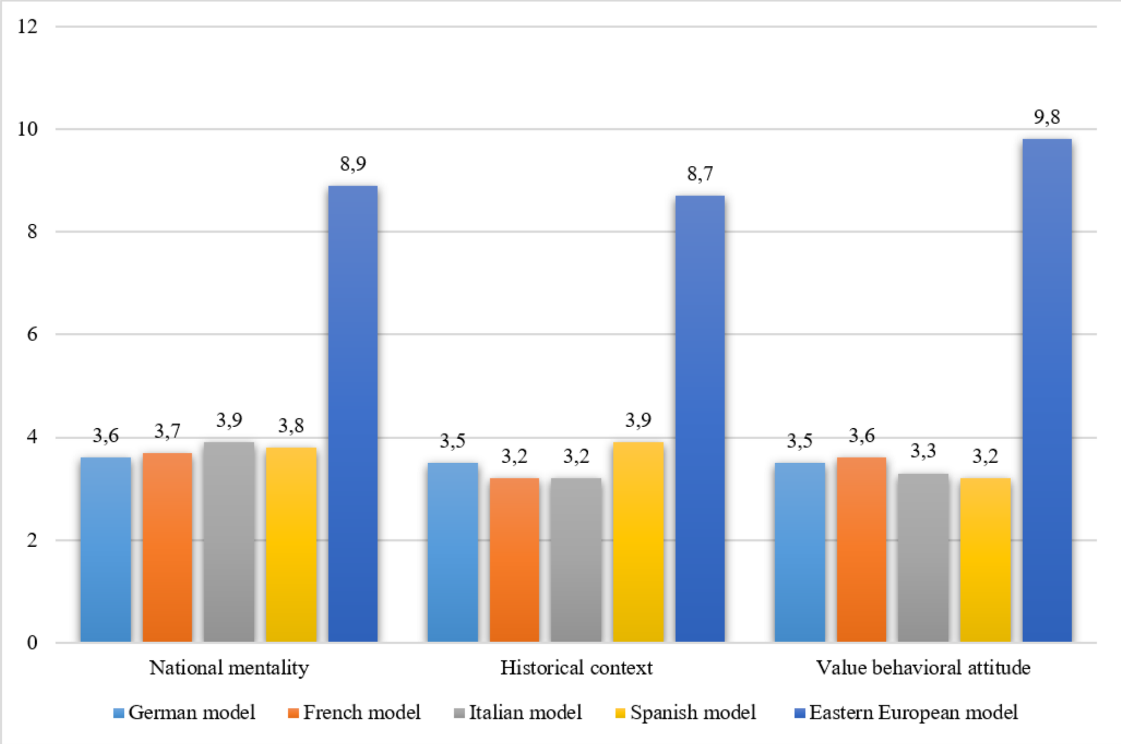

Figure 3. Assessment by 3d expert group of cultural components' influence on models of socio-economic development
(compiled by the author using the Neural Designer program)

Researchers from Eastern European Universities stated that cultural aspects have the greatest influence on the formation and development of the socio-economic models in Eastern Europe, in particular Poland, Romania and Hungary. Experts at an average level assessed the influence of cultural factors on the models of socio-economic development of Western and Southern Europe. The development of Germany and France was especially critically assessed as «the countries least exposed to the cultural context».

For the experts in the 3d group, the influence of the mentality and historical context on the formation of the model of socio-economic development of the countries of Eastern Europe is certainly decisive.

That is, even at the level of our results, we can see the heterogeneity and polarization of expert opinion regarding the influence of cultural factors on regional models. Experts from Western European countries believe that Eastern European countries are the least affected, while experts from Eastern European universities believe that, on the contrary, Eastern European models are most strongly influenced by the historical context, mentality and values.

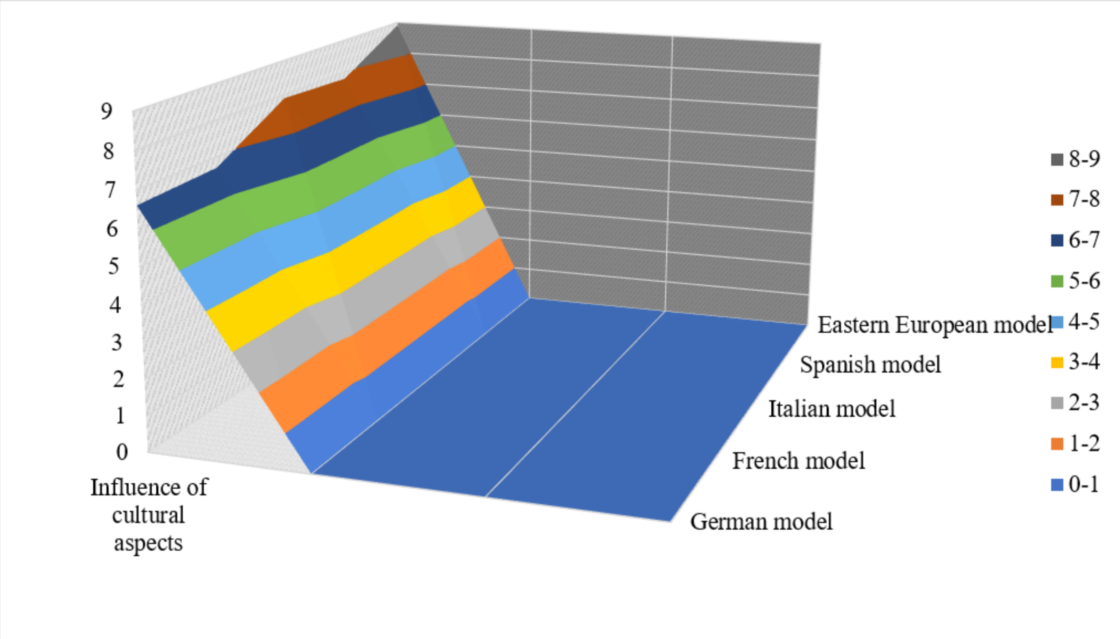

Figure 4. The overall profile of the influence of cultural components, identified by experts from universities in Western, Southern and Eastern Europe.
(compiled by the author using the Neural Designer program)

Figure 4 shows that the average score for each of the models analyzed by the experts allows us to speak about the relatively strong influence of cultural factors on the models of socio-economic development of the regions of the European Union. However, the general trend is extremely difficult to identify, since the opinions of experts turned out to be opposite in relation to the countries of Eastern Europe.

The results of our study regarding the influence of mentality on the socio-economic models of the EU countries are partially confirmed in the works by such authors as V. Vogel and D. Will (2023), I. Zvarych, O. Zvarych (2021), A. Serban et al., (2023), D. Soto-Oñate, G. Torrens (2022), M. Thatcher (2019), T. Tsekeris, S.K. Papaioannou (2021).

The results obtained on the dominant role of cultural factors for the formation of the socio-economic model of the countries of Eastern Europe are confirmed in the studies by such authors as O. Labianca (2020), E. Mamatzakis, L. Neri, A. Russo (2023), T. Marzal (2023), J. Premović, L. Arsić (2020), M. Proskurina (2022), B. Salikhov, I. Salikhova (2022), I. Schäfer, Y. Khoudja, D. Grunow (2022).

Indirectly, our results regarding the influence of the historical context on the socio-economic models of Western and Southern Europe are confirmed in the works by such authors as A. Garashchuk, Castillo, Rivera (2023), S. Groth (2022), R. Higgott (2020), M Jagódka, M. Snarska (2022), T. Juric (2023), M. Kruse, C. Somcutean, J. Wedemeier (2023).
The influence of behavioral values on the formation of the models in Southern Europe is also considered in the works by such researchers as L.H. Anders (2023), A. Bakry (2023a), A. Bakry (2023b), R. Brandtjen (2023), S. Ferran-Vila, G. Miotto, J. Rom-Rodríguez (2022).

Nevertheless, despite the rather wide topic coverage in the scientific literature, the problem of cultural influence on the socio-economic development of the regions in the European Union requires further empirical research.

Conclusion

Based on the empirical results, we state the following conclusions:

1. The method of expert assessments has identified the following main cultural aspects that can influence the models of socio-economic development of various regions of the European Union. Most experts agree that the historical context and mentality have the greatest influence on the development of the countries of Western and Southern Europe. At the same time, regarding the cultural influence on the development of Eastern Europe, the opinions of experts were divided into

completely opposite ones: Western European and Southern European experts argue that cultural factors played a moderate role in shaping the socio-economic model of Eastern Europe, while experts from Eastern Europe are confident in the determining influence of cultural and historical factors on the socio-economic development in the region.
2. The conducted empirical research confirms the fact that the European Union is heterogeneous not only in economic but also in cultural terms, since even at the expert level there is no consensus on the degree of key cultural components impact on the development of socio-economic models in the EU regions. This result also confirms the need for further qualitative research to identify in more detail the influence of cultural factors on the economy of the European Union.

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Enhancing future officers' physical preparedness in the process of professional training: a higher military education institution case study

Формування фізичної підготовленості майбутніх офіцерів у процесі професійної підготовки: дослідження в умовах вищого військового навчального закладу

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Abstract

The article reveals the results of a study of physical preparedness of cadets studying at the tactical level of military education in a Higher Military Educational Institution of the State Border Guard Service of Ukraine. The authors of the article determine that in the result of physical training, the future officers form a complex ability that combines intention for constant professional physical development and self-improvement, readiness to utilize applied and methodological knowledge on physical culture, applied motor skills and personal safety skills, defense and attack skills using special means and techniques of hand-to-hand combat, ability to use

Анотація

У статті розкрито результати дослідження фізичної підготовленості курсантів, які навчаються за тактичним рівнем військової освіти у вищому військовому навчальному закладі Державної прикордонної служби України. Визначено, що в результаті фізичної підготовки у майбутніх офіцерів формується к омплексна здатність, яка поєднує в собі прагнення до постійного фізичного розвитку та самовдосконалення, готовність застосовувати в процесі майбутньої службової діяльності прикладні та методичні знання з фізичної культури, прикладні рухові навички та навички особистої безпеки, навички захисту та нападу

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physical force and special means. A group of 275 cadets of 3-4 courses who were studying at the tactical level of military education was selected for the study. The generalized data allowed to conclude that the majority of cadets have an average level of formation of knowledge, abilities, skills and their average value of physical preparedness equals 3,420 on a five-point scale. The authors note that in the context of the traditional educational process, cadets are not sufficiently motivated to engage in physical education and their level of physical preparedness is affected by age characteristics and service employment.

Keywords: physical preparedness, future officers, management, competence, military education, professional training.

із застосуванням спеціальних засобів і прийомів рукопашного бою. Для дослідження була відібрана група з 275 курсантів 3-4 курсів, які навчалися за тактичним рівнем військової освіти. Узагальнені дані дозволили зробити висновок, що більшість курсантів мають середній рівень сформованості знань, умінь, навичок, ціннісних орієнтацій та професійних якостей, а середній показник фізичної підготовленості дорівнює 3,420 за п'ятибальною шкалою. В умовах традиційного навчального процесу курсанти недостатньо мотивовані до занять фізичним вихованням, а на рівень фізичної підготовленості впливають вікові особливості та службова зайнятість.

Ключові слова: фізична підготовленість, майбутні офіцери, управління, компетентність, військова освіта, професійна підготовка.

Introduction

Improving the level of professional training of officers of the State Border Guard Service of Ukraine (hereinafter referred to as SBGSU) is an important task of the professional education, especially in the context of military operations against Russian troops trying to annex the territory of Ukraine. Personnel of the State Border Guard Service should not only be competent in the field of the state border protection, have formed military professional skills and abilities, but also be ready to apply in the course of future operational activities applied and methodological knowledge of physical culture, applied motor skills and personal safety skills, defense and attack skills using special means and hand-to-hand combat techniques, the ability to use physical force and special means when performing service duties. Officers must endure physical exertion without reducing their professional performance in everyday activities and when conducting modern combat. The solution of this problem is impossible without further improvement of the system of professional training of future border guard officers, without involving them in systematic independent classes in various types of professional training, including physical training. Ensuring the necessary level of physical development is one of the most important components of individual professional training of the SBGSU personnel (Didenko et al., 2020). This is noted in a number of regulatory documents. In particular, in the Integrated Border Management Strategy for the period up to 2025 (Decree No. 687-R., 2019). Among the strategic goals and objectives, this document defines the improvement of the SBGSU personnel training system, the introduction of European standards in the educational process and bringing the level of training of officers in line with the requirements of best European practices, the use of modern educational technologies in the process of personnel training, as well as updating the basic training programs taking into account the Common Core Curriculum developed by FRONTEX Agency (Balendr et al., 2019a), recommendations of the EU (TAXUD) and the World Customs Organization, the implementation of revision of training terms and curricula to optimize costs (Soroka et al., 2020).

The problem of improving the physical training of security and defense sector officers at various levels of education has repeatedly attracted the attention of scientists. Various aspects of training and upbringing of police officers, including their physical training, have recently been studied by O. Morhunov in the study of physical education of Ministry of Interior personnel (Morhunov, 2020). Also, K. Prontenko investigated the development of powerqualities of cadets of Ukrainian higher military educational institutions during kettlebell lifting training (Prontenko et al., 2019). Besides, military sports education researchers state that while studying at military academy future officers don't form enough interest in regular physical activities, thus authors started to research the motivational aspects of the cadets' activities at military academies (Balendr et al., 2019b). Besides, the influence of mass sports work was studied in an educational institution regarding formation of the value attitude of cadets to physical education (Romanchuk et al., 2020). The research of the formation of health and fitness competencies of students in the process of physical education was conducted Griban and co-authors (Griban et al., 2020). Also of interest are studies that present various aspects of physical training of cadets of higher military educational institutions during classes (Prontenko et al., 2016), the peculiarities of formation of skills required for cadets of higher educational institutions (Bondarenko et al., 2020), an example of optimizing special physical training of cadets and describing the current state and directions for improving the physical training of the ground forces of the Armed Forces of Ukraine were the subject of attention (Romanchuk et al., 2010).

At the same time, the study of the quality of physical training of future border guard officers, in particular regarding their use in the course of future operational activities acquired applied and methodological knowledge of physical culture, applied motor skills and personal safety skills, defense and attack skills using special means and techniques of hand-to-hand combat, the ability to use physical force and special means when performing service duties, endurance to physical exertion without reducing professional performance in the conditions of daily activities, and if necessary, when conducting modern combat were not the subject of a separate study. The results obtained can be used to justify the holistic scientific and methodological support for continuous physical training of border guard officers at the tactical and operational levels of military education in modern conditions.

In the following sections of this article, we will analyze in detail the methodologies used to assess the physical readiness of future border guard officers at the tactical level of military education. Then, we will present the main findings of our study and discuss their relevance in the context of current military operations and the needs of the State Border Guard Service of Ukraine

Thus, the purpose of the article is to study the physical preparedness of future border guard officers at the tactical level of military education in the context of a traditional training system.

Methods

For experimental work, a group of cadets (recruited in 2016 and 2017) was selected in the amount of 275 people who studied at 3-4 courses of the first (Bachelor's) level of higher education (tactical level of military education). The study lasted from March to May 2019. It was aimed at obtaining quantitative parameters according to the selected criteria (psychological-axiological, subject-instrumental, behavioral-competence and individual-functional), each of which consisted of the correspondent indicators. A mixed approach was used to obtain data on these indicators (Schoonenboom et al., 2017), according to which the study applied qualitative and quantitative methods to obtain reliable data (Guest, 2013).

On *the first stage* of the study the scientific literature on the research problem was analyzed, the requirements for officers of the SBGSU units were summarized, and the subject of assessment and diagnostics was determined. From the analysis and generalization of sources, it was established that the result of complex physical training of cadets at higher military educational institution is *a skill, characterized by the desire for constant professional physical development and self-improvement, readiness to apply in the process of operational activities of acquired applied and methodological knowledge on physical training, applied motor skills and personal safety skills, defense and attack skills using special means and techniques of hand-to-hand combat, the ability to use physical force and special means in the performance of official duties, physical endurance to endure physical exertion without reducing professional performance in the conditions of daily activities to protect the state border, and if necessary, when conducting modern combat. This ability covers the physical and volitional properties of the officer's personality, general physical and special physical fitness, taking into account modern requirements for specialists of the border security sphere.*

On *the second stage* of the research the criteria and indicators were defined. So, the indicators of the psychological-axiological criterion encompassed the desire of cadets to master the skills and abilities of personal safety; developing their physical endurance, physical-volitional qualities, general physical and special physical preparedness; the level of formation of a value attitude to physical culture and sports classes, attitude to a healthy lifestyle; the formation of a desire for physical self-improvement. To obtain quantitative data on these indicators, we used a survey on the leading motives; "Rapid diagnostics of social values of the individual"; A. Rean's methodology "Satisfaction with the chosen profession"; methodology "Value orientations" by M. Rokich; a methodology of monitoring the actions of cadets in various situations of educational activities and sports, expert assessment of these actions; survey to determine the attitude of cadets and students to a healthy lifestyle; questionnaire by B. Cretty (a special questionnaire that suggests using a ten-point scale to assess various factors that help to train well).

According to the indicators of the subject-instrumental criterion were studied: the level of knowledge of the theoretical foundations of physical culture and sports; knowledge of regulatory documents on the organization and conduct of physical training with personnel in the State Border Guard Service; knowledge of cadets of the methodology for conducting physical training classes with personnel as well as the sports and fitness activities in the units of the State Border Guard Service; knowledge of the principles of a healthy lifestyle and the requirements of personal and public hygiene. Quantitative data on these indicators were obtained using a survey (written and oral); testing (on paper and electronic media); performing control and project work; the method of observation; performing practical tasks; assessing knowledge during the participation of cadets in role-playing games and when solving situational problems; the method of expert assessment.

Using indicators of the behavioral-competence criterion, the level of proficiency in performing exercises and standards for physical training, the ability to apply physical measures, special means and techniques of hand-to-hand combat was studied. To obtain quantitative data on these indicators, we used the method of evaluating the performance of practical tasks and standards by cadets; the method of observation.

According to the indicators of the individual-functional criterion, the level of physical strength; endurance; speed; flexibility; dexterity; adherence to a healthy lifestyle; pedagogical abilities was studied. To obtain quantitative data on these indicators, we used the method of evaluating cadets in various situations of educational and official activities; the method of expert assessment; essays; interviewing; evaluating the properties of cadets when solving situational tasks, performing practical tasks and meeting standards.

On *the third stage* the study analyzed and interpreted the obtained data, presented certain aspects in professional articles in scientific journals. The reliability of the content and the results obtained was verified by expert evaluation. The selection of experts is implemented in two stages. At the first stage, 32 experts were selected from 48 applicants according to the criteria of documentary selection. The second stage of the selection provided for the use of an additional questionnaire, which provided for receiving answers to questions from expert-candidates in the subject area. Based on the results of the second stage, 24 experts were selected – heads of departments of the educational institution, professors and associate professors with more than 10 years of teaching experience from the Department of Physical Training and Personal Security of the Faculty of State Border Security, as well as officers of the State Border Guard Service who have experience in managing physical training and sports in the state border protection bodies.

Results

As a result of summarizing the numerical data (points) obtained by each survey participant in accordance with the indicators of the psychological-axiological criterion, the tables were constructed in Microsoft Office Excel format. The use of this program made it possible to summarize the scores obtained applying various research methods. Thus, it became possible to determine for each respondent (study participant) the average score for each indicator of all four criteria. Tables 1-4 show the distribution of physical fitness levels by indicators of each criterion. The average values of physical preparedness of the study participants were also determined by indicators in points, which are summarized in Table. 5.

Numerical data on indicators of the psychological-axiological criterion were obtained using appropriate research methods. This made it possible to build Table 1 with a distribution by physical preparedness levels of future border guard officers at the tactical level of military education.

Table 1.
Distribution by physical preparedness levels of future border guard officers (tactical level of military education) by indicators of psychological-axiological criteria (n = 275)

Levels / Indicators	Low Q-ty	Low %	Average Q-ty	Average %	Sufficient Q-ty	Sufficient %	High Q-ty	High %
Intention to master personal safety skills and abilities	55	19.99	97	35.27	84	30.54	39	14.18
Intention to develop the physical endurance, physical-volitional properties, general physical and special physical preparedness	51	18.54	89	32.36	100	36.36	35	12.72
Value attitude to physical culture and sports classes	49	17.82	101	36.73	81	29.45	44	15.99
Value attitude to a healthy lifestyle	44	15.99	97	35.27	83	30.18	51	18.54
Striving for physical self-improvement	55	19.99	105	38.18	66	23.99	49	17.82

Source: calculated and built by the authors.

The study concludes that 19.99% of the study participants demonstrated the intention to master personal safety skills at a low level, and 14.18% of the participants - at a high level. As for the intention to develop physical endurance, physical and volitional properties, general physical and special physical preparedness, it is manifested at a low level by 18.54% of the participants, and at a high level - by the 12.72%. According to this indicator, the vast majority of cadets have average and sufficient levels – 32.36% and 36.36%, respectively. The value attitude to physical culture and sports classes and the value attitude to a healthy lifestyle at a high level were formed by 15.99% and 18.54% of the participants, respectively, which indicates the presence of certain pedagogical reserves for the formation of values of future officers.

Also quite noticeable is the proportion of cadets (55 participants) who showed a low level of intention for physical self-improvement. According to this indicator, 38.18% of survey participants are at an average level, 23.99% are at a sufficient level, and only 17.82% of future officers are at a high level.

Table 2 shows the distribution by physical preparedness levels of future border guard officers at the tactical level of military education by indicators of the subject-instrumental criterion.

Table 2.
Distribution by physical preparedness levels of future border guard officers (tactical level of military education) by indicators of subject-instrumental criterion (n = 275)

Levels / Indicators	Low Q-ty	Low %	Average Q-ty	Average %	Sufficient Q-ty	Sufficient %	High Q-ty	High %
Knowledge of the theoretical foundations of physical culture and sports	49	17.82	114	41.45	75	27.27	37	13.45
Knowledge of regulatory documents regulating the organization and conduct of physical training in the SBGSU	57	20.73	101	36.73	86	31.27	31	11.27
Knowledge of the methodology of conducting physical training classes with personnel and mass sports work in the units of the SBGSU	47	17.09	98	35.64	88	31.99	42	15.27
Knowledge of the specifics of the use of physical force and special means in cases defined by law	36	13.09	108	39.27	78	28.36	53	19.27
Knowledge of the principles of a healthy lifestyle and the requirements of personal and public hygiene	45	16.36	103	37.45	66	23.99	61	22.18
Knowledge of the specifics of using special equipment and tools during all forms of physical training	40	14.55	98	35.63	74	26.90	63	22.90

Source: calculated and built by the authors.

The study allows us to conclude that the largest share of cadets at a low level is recorded in the indicator "knowledge of regulatory documents regulating the organization and conduct of physical training in the State Border Guard Service" – 20.73 %. According to this indicator, the smallest share of cadets who showed a high level was also recorded – only 11.27% of the total number of respondents. So, it can be stated that there are certain gaps in the mastering of educational material that concerns the specifics of regulatory-normative base of the organization and conducting of physical training in the State Border Guard Service.

Regarding the high level, the largest share of cadets was recorded by the indicators "knowledge of the principles of a healthy lifestyle and the requirements of personal and public hygiene" and "knowledge of the specifics of using special equipment and tools during all forms of physical training" – 22.18% and 22.90%, respectively. Table 3 shows the distribution by physical preparedness levels of future border guard officers at the tactical level of military education by indicators of the behavior-competence criterion.

Table 3.
Distribution by physical preparedness levels of future border guard officers (tactical level of military education) by indicators of behavior-competence criteria (n = 275)

Levels	**Low**		**Average**		**Sufficient**		**High**	
Indicators	**Q-ty**	**%**	**Q-ty**	**%**	**Q-ty**	**%**	**Q-ty**	**%**
Skills and abilities of performing exercises and standards of physical training	29	10.54	134	48.73	65	23.64	47	17.09
Knowledge of the methodology of conducting all forms of physical training of personnel and mass sports work in the divisions of the SBGSU	37	13.45	141	51.27	61	22.18	36	13.09
Ability to apply physical measures, special means and techniques of close combat;	55	19.99	123	44.72	56	20.36	41	14.91
Personal and public hygiene skills	32	11.64	121	43.99	71	25.82	51	18.54
Skills and abilities in organizing competitions in military-applied sports	39	14.18	168	61.09	51	18.54	17	6.18
Abilities and skills to control the physical preparedness of the subordinates and evaluate the physical training of the unit	49	17.82	132	47.99	71	25.81	23	8.36

Source: calculated and built by the authors.

Generalization of the results of the study allows us to conclude that the smallest share of cadets at a high level is recorded in the indicator "skills and abilities to organize competitions in military-applied sports" – 6.18%, as well as in the indicator "abilities and skills to control the physical preparedness of the subordinates and evaluate the physical training of the unit" – 8.36 %. This may indicate that during their studies at the Higher Military Educational Institution, cadets do not achieve program learning results based on these indicators. In addition, according to these indicators, a significant share of cadets with a low level was recorded – 14.18% and 17.82%, respectively. Quite unexpected, prompting for a deeper study, is the result regarding the ability to apply physical coercive measures, special means and techniques of hand-to-hand combat. In particular, about 20% of respondents showed a low level in this indicator. The cadets showed the best results in the indicator "skills and abilities of performing exercises and standards of physical training". In particular, 10.54% of respondents are at a low level, 48.73% are at an average level, 23.64% are at a sufficient level, and 17.09% are at a high level.

Besides, according to the indicators of the individual-functional criterion, the study aimed to study the level of physical strength; endurance; speed; flexibility; dexterity; adherence to a healthy lifestyle; pedagogical abilities. Generalized results by the distribution of study participants by level of physical preparedness according to the indicators of the individual-functional criterion are presented in Table 4.

Table 4.
Distribution by physical preparedness levels of future border guard officers (tactical level of military education) by indicators of individual-functional criteria (n = 275)

Levels	Low		Average		Sufficient		High	
Indicators	**Q-ty**	**%**	**Q-ty**	**%**	**Q-ty**	**%**	**Q-ty**	**%**
Physical strength;	21	7.63	119	43.27	78	28.36	57	20.72
Endurance;	25	9.09	125	45.45	80	29.09	45	16.36
Speed;	37	13.45	131	47.63	56	20.36	51	18.54
Dexterity;	40	14.54	83	30.18	73	26.54	49	17.81
Commitment to a healthy lifestyle;	39	14.18	98	35.63	77	27.99	61	22.18

Source: calculated and built by the authors.

The study suggests that the smallest share of cadets at a high level was recorded in the indicator "pedagogical abilities" – 15.63 %, as well as in the indicator "endurance" – 16.36 %. The largest share of cadets with a high level was recorded in the indicators "commitment to a healthy lifestyle" (22.18 %) and "physical strength" (20.72 %). As for the low level, the largest share of cadets was recorded in the indicator "dexterity" (14.54 %) and "commitment to a healthy lifestyle" (14.18 %). Therefore, this may indicate that there are problems in the educational process regarding the development of cadets' pedagogical abilities and dexterity. At least in relation to these indicators, it is advisable to find pedagogical reserves.

The results presented in tables 1-4 allowed us to determine the average score for the indicators of each criterion. To do this, we used the formula:

$$x = \frac{a \times 2 + b \times 3 + c \times 4 + d \times 5}{n}, \quad (1)$$

where x is the average score; a - the number of cadets at a low level, b - the number of cadets at an average level; c - the number of cadets at a sufficient level; d - the number of cadets at a high level; n - the total number of survey participants. At the same time, a low level corresponds to a value of 2 points, an average level - 3 points, a sufficient level - 4 points, and a high level - 5 points. Using the formula (1), calculations were performed, which were summarized in Table 5.

Table 5.
The value of average points according to the criteria of physical preparedness of future border guard officers (tactical level of military education) (n = 275)

Criteria	Average score
Psychological-axiological	3.433
Subject-instrumental	3.464
Behavioral-competence	3.341
Individual-functional	3.445
Average value	**3.420**

Source: calculated and built by the authors.

Discussion

The results of the study are of a particular interest, since they indicate the connection of the level of general physical and special physical training with the state of the value-motivational sphere of cadets. So, for example, the average value of physical preparedness of future border guard officers, which is not sufficient and is equal to 3,420 points on a five-point scale, is explained by the fact that only 12.72% of respondents have the desire to develop physical endurance, physical and strong-willed qualities, general physical and special physical preparedness is manifested at a high level. Similar results are observed in relation to the value attitude of cadets to physical culture and sports classes, the value attitude to a healthy lifestyle (15.99% and 18.54%, respectively, were formed at a high level).

The survey showed a necessity to conduct the in-depth analysis of the reasons for the low level of methodological training of cadets regarding control of the physical condition of subordinate personnel, the ability to assess the physical training of subordinate units, since only 6.18% of respondents showed a high level in the indicator "skills and abilities in organizing competitions in military-applied sports".

Quite unexpected, prompting for a deeper study, is the result regarding the ability to apply physical coercive measures, special means and techniques of hand-to-hand combat. In particular, about 20% of respondents showed a low level in this indicator.

As part of the study, the motives that motivate cadets to engage (table. 6) in physical exercises, sports, as well as master the skills of personal safety and the use of force were also clarified. The attitude of cadets and trainees to attending physical education classes was also studied. To do this, cadets and officers of the Faculty of management staff training were asked to determine the rank through a questionnaire and choose ten main motives that encourage future officers to independently engage in physical exercises, sports, as well as master the skills of personal safety and the use of force.

Table 6.
Motives that encourage cadets of the tactical level of military education to engage in physical exercises, sports, as well as master the skills of personal safety and the use of force (n = 275)

Motives	Rating	Share, %
The desire to engage in physical culture and sports in order to prepare for future professional activities	1	33.09
The desire to improve the health and physical condition	2	31.64
The desire to increase the level of endurance, agility, flexibility, speed and develop strength	3	30.54
The desire to increase the level of physical preparedness	4	29.09
Striving to get positive grades in the disciplines of Physical Education, Personal Safety and the Use of Force	5	27.27
The desire for informal communication during physical education and sports	6	25.45
The need to be a member of a sports team, group, or part of a team	7	22.54
The desire to avoid trouble and punishment in connection with skipping classes	8	21.81
The desire to achieve success in a particular sport	9	19.90
Striving for physical self-affirmation	10	18.54
The desire to lose weight or be in optimal physical shape	11	17.09
Striving for social self-affirmation	12	16.36
The motive of emotional pleasure from physical education and sports	13	15.27
Striving for stress and overcoming it during physical education and sports	14	14.18
The desire to master the technique of performing self-defense techniques	15	12.72
The desire to be a student of a coach with outstanding personality	16	10.18
Desire to improve the technique of performing physical exercises	17	7.63
The desire to engage in physical culture and sports to compensate for the lack of mobile activity	18	6.54
Sports and educational motive	19	5.81
The habit of attending any classes in any disciplines	20	5.45
Orientation for an outstanding sporting achievement	21	3.63
Other motives	22	2.18

Source: calculated and built by the authors.

The data shown in Table 6 indicate that cadets in the rating show dominance of professional motives (the desire to engage in physical culture and sports in order to prepare for future professional activities – 33.09 %; the desire to increase the level of endurance, agility, flexibility, speed and develop strength – 30.54; the desire to increase the level of their physical preparedness – 29.09).

Conclusions

The study also clarified the attitude of cadets to attending physical education classes, personal safety and the use of force. Summarizing the results of the survey (the sample included 275 cadets) using an anonymous questionnaire allowed us to find out that 27.64% of cadets always expect classes with great desire; 32.36% of cadets attend classes, but without much interest and desire. The share of cadets who attend classes, but are looking for an opportunity to avoid physical exertion – 19.64 %. It also turned out that 11.64% force themselves to attend classes on physical education, personal safety and the use of force. In addition, 7.63% of cadets surveyed consider physical education, personal safety and the use of force completely unnecessary.

The results obtained were discussed with psychologists of educational departments. They expressed the opinion that the attitude of cadets to physical fitness is influenced by the age characteristics of cadets, dominant trends in the youth environment, as well as academic and official employment of cadets. Because of this, the implementation of exercises and standards for physical training is often ignored by cadets, and as for personal and public hygiene skills, which cadets have shown high levels of, they practice them almost daily.

So, the article presents the results of a study of physical training of cadets in the conditions of the traditional system of training at the tactical level of military education at the Higher Military Educational Institution. The results obtained indicate the existence of educational and pedagogical reserves. For their implementation, it is necessary to substantiate the conceptual foundations of continuous physical training of border guard officers at the tactical and operational levels of military education. This task is promising for further exploration in this direction.

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Modern education: key factor in global innovation in higher education

Сучасна освіта: ключовий фактор глобальних інновацій у вищій освіті

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Abstract

The role of education in the educational space of a higher school is shown and it is measured as a aspect in the international procedure of informatization of higher education. The main features of modern society and the main trends that change the image of education are highlighted. The leading models of the educational progression as a factor of the global process of informatization of higher education, which are built based on network computer technologies, are considered. For quality education, the main criteria for selecting means of organizing the educational process are recognized; basic didactic and specific principles. Positive features of modern education are emphasized. Finding effective ways to improve higher education, is considered a factor of the global informatization process. A survey of students of various specialties in institutions of higher education was conducted to find out the key traditions of global quality training of future competitive specialists in the innovative process of

Анотація

Показано роль освіти в освітньому просторі вищої школи і розглянуто її як фактор глобального процесу інформатизації вищої освіти. Виокремлено головні риси сучасного суспільства та основні тенденції, що змінюють образ освіти. Розглянуто основні моделі освітнього процесу як фактору глобального процесу інформатизації вищої освіти, які побудовані на основі мережних комп'ютерних технологій. Для якісної освіти виокремлено основні критерії відбору засобів організації навчального процесу; основні дидактичні та специфічні принципи. Наголошено на позитивних рисах сучасної освіти. З метою з'ясування дієвих шляхів удосконалення вищої освіти її розглянуто як фактор глобального процесу інформатизації. Було проведено анкетування студентів різних спеціальностей у закладах вищої освіти для з'ясування головних шляхів глобальної якісної підготовки майбутніх конкурентоздатніх фахівців в інноваційному

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higher education. The prospects for the growth of modern education and the ways and means of education, which allow for a complete restructuring of the educational sector, improve and even change the educational process, are considered. The essence of today's most accessible and effective online education projects is revealed.

Keywords: educational space of a higher school, innovative education, independent work, restructuring of the educational sector, technologies.

процесі вищої освіти. Розглянуто перспективи розвитку сучасної освіти та шляхи, засоби форми освіти, які дозволяють повністю реструктуризувати освітню галузь, удосконалити і навіть змінити освітній процес. Розкрито сутність найбільш доступних і ефективних у сьогоденні онлайн-проектів освіти.

Ключові слова: освітній простір вищої школи, інноваційна освіта, самостійна робота, реструктизація освітньої галузі, технології.

Introduction

The progress of current technologies variations the image of the world and the dimensions of being in it, which are used to it, rapidly opens up inexhaustible possibilities and practically limitless perspectives: the worldview of people, the way of life, the system of individual values and social values, forms new relationships between man and the world, qualitatively different principles of activity people and organization of life (Abakumova, 2021).

The world public is talking about the necessary radical reform of the scheme of higher education, which exists today, at the threshold of the XXI century of the third decade, because the world educational space, at the moment, does not correspond to the new conditions of the existence of humanity. So, one of the burning, main, and important difficulties of modern education is the creation of a promising, modern, innovative education system capable of preparing the entire humanity of our planet for modern life in the conditions of post-industrial civilization (Stratan-Artyshkova et al., 2022).

Ensuring free and easy access to information from the entire world's educational space is the main feature of modern society. A real manifestation of modern civilization, which is shaping our future, is that the elements of the global infrastructure are currently functioning and shaping the modern world community.

Experience in the development of the global Internet network allowed the development and implementation of information processing tools and systems in the educational sector. The beginning of a new era allowed each user in such a network to perceive himself and be perceived by other individuals as an organic part of an innovative unified socjety.

A rather promising and important direction of the progress of the entire educational space should be the wide implementation of technologies and methods of self-education and distance education built on the use of promising and modern statement, information, means of remote access to distributed databases, digital technologies, knowledge of educational and methodological and scientific and technical information (Nychkalo et al., 2021).

Considering the serious and weighty contribution of the outlined problems, it is worth emphasizing that the innovative development of the system of higher education institutions of Ukraine is a controversial process and is insufficiently developed in the scientific and methodological aspect. In particular, today there is a ripe need for substantiation of ways to improve universal education under the conditions of expanding autonomy and decentralization of management of higher educational institutions. In this regard, in the article we considered the following aspects: the main trends that change the image of education; basic didactic principles on which pedagogical interaction is built with the aim of effective innovative learning; the main ways for a promising system of society to innovations; the essence of the most accessible and effective distance online education projects today is shown; the forms of modern education are characterized as a factor of the global process of innovativeness of higher education in the consciousness of remote space.

Literature review

The theoretical analysis of the problem indicates a wide range of scientific investigations, the results of which serve as a basis for further research. The conceptual foundations of innovative educational processes are considered in the socio-philosophical context of civilizational changes, the justification of a new paradigm of education, and the search for ways to overcome its crisis state. I. Mala (2022) reviewed the structures and showed the spirit of distance learning as an effective tool in organization education. The scientist finds out the advantages and problems, the main principles of distance learning; emphasizes the methods, pays attention to modes and forms of distance learning as an actual means of organization education; and analyzes the elements of distance learning. At the beginning of the 21st century, N. Nychkalo, N. Lazarenko, & R. Hurevych (2021) showed the methods of digitalization and informatization of education, related to digitalization and informatization of social processes. The beginning of the informatization of society was found out and the ways of its acquisition in recent years of a global character were revealed not only in the industrialized states of the world but also in many developing countries of the world community. Objects and results in the information society of the work of the majority of the employed population are information resources and knowledge. N. Bazyliak (2022) researched that the development of remote learning tools, global information networks, and mass communication caused the emergence of a new information society. The examples show the rapid growth of higher education institutions that use remote technologies without fail.

V. Yahupov, L. Petrenko, & S. Kravets (2019) proposed the conceptual principles of distance learning in professional and practical educational foundations for qualified workers, the concept of training qualified workers by distance learning was presented in technical educational institutes, the scientists substantiated the principles of distance learning and methodological principles in the scheme of specialized and technical education. O. Abakumova (2021) conceptually developed a version of reflection and presented distance education as a socio-cultural educational phenomenon of the modern world; researched the reconstruction of the history of the birth of distance education and presented a retrospective of the key stages of the creation of the phenomenon of distance education; the author's periodization of distance education is proposed; in the instructive space, the genesis of distance learning is reproduced and the deployment of actual distance learning of higher education seekers is shown.

We have set ourselves the task of finding effective ways to improve higher education, considering it as a factor in the global informatization process; highlighting the main features of modern society and the main trends that change the image of education; Consider the main models of the educational process, including in the distance format, as a feature of the international method of informatization of higher education, which are built based on network computer technologies; identify the key norms for selecting resources of forming the educational process; basic didactic and specific principles; find out the constructive structures of modern education that show its character; to highlight features that contribute to the total procedure of informatization of higher education, make it perfect and innovative.

Issues of the development of the innovative potential of general educational institutions, in particular, the innovative competence of teachers as the main resource that determines the school's readiness to implement innovations, remain insufficiently covered. Mechanisms for forming innovative missions, strategies, and the environment of educational institutions require further development and roles in these processes of subjects of innovative activity. The difficulties that the pedagogical teams of schools constantly face when implementing innovations actualize the need for scientific, methodical and informational support for innovations.

However, despite the significant number of scientific works, the problem of innovative development of the teacher not only does not lose its significance, but also acquires a new meaning in the modern conditions of the development of national education.

The relevance of the research problem is also strengthened by a number of contradictions that exist in the educational space of Ukraine, namely, between:

- modern needs for innovative development of society and training of educational personnel for innovative activities;
- the objective necessity of active inclusion of teachers in the creative process, innovative pedagogical search, innovative activity and outdated forms of organization of the modern system of methodical work;
- the need for innovative development of teachers in the system of methodical work and the development of appropriate organizational and pedagogical principles for the implementation of this process.

Thus, the relevance of the outlined problem, its insufficient development in modern pedagogical theory and practice, the identified contradictions determined the choice of the topic of our article.

The purpose of the article: to demonstrate the role of modern education in the educational space of a higher school and consider it as a factor in the global process of informatization of higher education.

Methodology

To solve the set goal of the study at many steps of systematic research, a traditional of mutually agreed methods was used: general scientific methods of research – bibliographic (study of manuscripts, systematization of periodicals, scientific literature, etc.); concrete-scientific – synthesis, historical-pedagogical analysis, generalization (to reveal the features of higher education, its specificity, content and purpose to identify documents from the researched problem); semantic and terminological analysis made it possible to specify the main concepts of the study; historical-genetic – enabled the structuring of methodological bases of research, source base, historiography, contributed to the study of the genesis of innovative education in the educational space of a higher school; constructive-genetic determined the justification of the development of higher education as a methodological tool that allows characterizing the reception and perspective of the development of education; the conclusions were formulated and the studied materials were summarized by the method of interpretation; empirical methods – questionnaires, pedagogical observation, tests – to find out the key traditions of global quality training of future competitive specialists in the innovative process of higher education.

The research was conducted at the methodological, theoretical, and practical levels.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main and final.

At the preparatory stage, the purpose and tasks of the research were determined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, an experiment was conducted.

At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment.

The reliability and validity of the obtained results, the objectivity of their assessment was ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

In the informative space of a higher school, the theoretical level reflects the main principles of the development of education, the system of professional training of future specialists, taking into account world trends in the development of the educational field. The professional training of specialists in the educational space of a higher school is based on the technologies of innovative education, philosophical, psychological-pedagogical, and cultural principles, aimed at implementing the ideas of anticipatory development, and continuity based on personally oriented and systemic approaches.

The practical level made it possible in the educational space of the higher school to train specialists with the help of innovative education, the creation of an educational and methodological complex for those seeking education, and teachers of higher education.

The total sample size is 44 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step. The experiment consisted of four survey stages.

The experiment showed an undoubted dynamics of growth in the development of students' knowledge and skills in informatization, up to the consideration of ways of strengthening the main criteria for selecting methods for organizing the initial process.

Results and discussion

In modern conditions, education is considered the most central factor in the economic progress and social progress of mankind, because the individual himself is the main value of civil society, can master new knowledge, accept and find non-standard solutions (Bazyliak, 2022).

The face-to-face and distance forms of education are relevant today, and distance education is not inferior to the quality of education, because, at a concrete practical level, technologies today have made the exchange of pedagogical experience of teachers a reality, improved collective development and contributed to the implementation of better educational and methodological and didactic work of the teaching staff, without leveling individuality, the need for strict unification, which destroy higher education. Following world educational standards, specialized distance education quality control is being developed and improved. Correlation of individual, social, public and personal, appropriate and desirable, normative and innovative in educational activity, the interaction of the learner and the teacher takes place during the acquisition of knowledge based on cooperation with the dominance of independence of the educational development. All this requires innovative modern education to recognize the presence of a significant humanistic potential, which should be fully actualized, constantly increased, able to be applied in time in education, and at the same time take into account the appropriateness of the schedule and distribution of study time, individual personal inclinations of the student. For innovative education of a higher school, it is necessary to take into account collective action and exchange of experience, the imperative of self-organized communities, mutual education, mutual learning through interaction and communication, diversity and continuity, accessibility and openness of education, equality of opportunities and rights (Abakumova, 2021).

In connection with the relevance of awareness for the current global process of informatization of the world, we, to the most important figures, have presented the following for a promising system of society:

- the advanced nature of the system of high education, its directness to the development of the creative abilities of people, the problems of future civilization;
- fundamentalization of the greatest illumination that can advance the essence of its quality;
- availability of a high-level education system for students based on promising communication, information, digital technologies for self-education, and a wide variety of distance education methods. Other factors that influence the entire system of great illumination can also be understood, but it is important to overestimate the significance of the names.

The descendants of various countries are constantly thinking about the so-called synergy of technologies, a combination of digital innovative technologies (Mammadova, 2022). Let's take a look at the ways and methods that allow us to completely restructure the lighting system, improve, and finally change the lighting process.

The Internet of speeches can formulate ideas and decisions, allowing you to combine real, piecemeal intelligence with virtual light based on large amounts of data contained in IoT.

Virtual augmented reality allows for the creation of new light, rich in the production of greater illumination, and 3D robots and robotics allow more routine operations to be automated (Antón-Sancho et al., 2023).

In all areas of life and everyday life, information systems have advanced. A great range of possibilities is reflected in the development of digital technologies. In the light, dry gallus, in the industry, progress is being made with significant fluidity, not taking into account our hoarding and supply (Swiatek, 2023).

Digital technology in our time is a discrete system, which is based on methods of information transfer and coding, which allows many different tasks to be completed in a short period. The circuits and speed codes themselves were created by IT technologies, and the desktops required by the global process of informatization of global lighting, video, and digital technologies without any possible distance of lighting (Nychkalo et al., 2021).

To support modern education, as a factor in the global process of higher education innovation, higher education institutions can use freely distributed, free systems for creating distance courses such as Olat, ATutor, Moodle, and Ilias (Tang, & Shen, 2022).

We will reveal the essence of the most accessible and effective online distance education projects today:

- *Classtime*, a digital tool service that is convenient for teachers, helps to evaluate the success of a group of students and each student of higher education individually, and also allows you to conduct and create interactive online classes;

- *MySchool* is an online environment adapted for quality education for students, their parents, teachers, and heads of education departments. It unites all those interested in quality education in the learning process with the help of an online library with multimedia materials for higher education applicants, automation of the document flow of higher education institutions, notes for teachers from all disciplines, topics for all categories of future specialists with the inclusion of various SMS services ;
- *Learning.ua*, a digital online project with an emphasis on Common Core international education standards, which includes interactive interesting tasks and games for students and as a result of which students can acquire high-level knowledge;
- *EdERA*, a project that offers online education in the format of mass open online courses and includes interactive lectures, notes with explanations, and homework, provides the opportunity to communicate with other education seekers;
- *MiyKlas* is a platform with a wide range of tests and tasks, and educational materials that allow you to study disciplines in an interactive form (Hevko, 2020).

In modern education, as a factor in the global process of innovation of higher education, the active role of the teacher is significantly strengthened, since the teacher must monitor the knowledge level of the student, and make decisions about adjusting the educational program to best master the material. If necessary, the student of higher education can receive teaching advisory assistance, while communication can be through the Internet in online mode (Kravchenko et al., 2023).

Independent work of students, which organizes work and motivates independent expansion and deepening of acquired knowledge, is of great importance in modern education. The student acquires the ability and skills of optimal use of time, independent selection of information sources, the ability of personal and business qualities, and objective assessment of one's potential. The organization of online independent activities of education seekers requires skills in the use of innovative educational technologies, the implementation of which contributes to the formation of appropriate social personal qualities of the individual, stimulates the disclosure of internal reserves in students, and contributes to the performance of various social roles, interaction in a team, solving cognitive tasks, etc. In this approach, the most significant is the help of the project method, cooperative education, and research-problem-based teaching methods (Vynnychuk et al., 2022).

The most influential and important factor for the effectiveness of a student's independent work is the awareness of the purpose of each specific task and performed activity (Karayel, 2023). The student must clearly understand the essence of the task and the concreteness of the final result, and the indicator of the highest educational level of the student of higher education and the development of his independence is the ability to independently formulate and realize the final and intermediate goals of the task (Mala, 2022).

Modern education is intolerable without the use of communication and information skills in all their forms, which provide an opportunity to create new forms of pedagogical interactions (Vizjak et al., 2023).

Let's name the main trends that are changing the image of education:

- the emergence of new communication opportunities that "compress" time and space and shorten the distance of social influence on education;
- transformation of education from a concentrated form of socialization of the individual into personal and social capital in the context of the significance of the growth of the methodology of cognition and acquired knowledge as a resource of social development;
- development of open education – forms of implementation of new innovative processes of self-education and education based on free and open access to educational resources;
- permanent review at all levels of the methods and content of education, due to the process of rapid informatization of society;
- informatization of education – the outline of modern computer technology into institutions, its use as a new innovative pedagogical tool and instant means of communication;
- replacement of the imperative "Education for a lifetime" with the imperative – "Education for a lifetime";
- globalization of educational processes – the formation of the world's single educational chronotope: space-time and the world education system (Abakumova, 2021).

Let's name the main didactic principles on which pedagogical interaction is built with the aim of effective innovative teaching.

It is appropriate to consider innovative education through classical well-known didactic principles – scientificity, problem-solving, accessibility, unity of educational, educational, developmental functions, consciousness, activity, consistency, systematicity, individualization, visibility, contextuality, the strength of knowledge, the applied orientation of professional training of future specialists in institutions of higher education (O'Sullivan, 2021).

The transformation of computer technologies into computer pedagogical technologies takes place in the context of the laws of didactics. The implementation of didactic principles in the formation of the information and educational environment of innovative education should be considered in the context of the global process of informatization of higher education, and the use of ICT in the educational process, which takes place within the framework of the concept of programmed learning (Hogan et al., 2022).

This approach formed several didactic principles specific to innovative education to develop the global development of informatization, in particular, these are:

- the priority of the didactic approach;
- standardization of the content of education;
- didactic substantiation of the expediency of using innovative ICT in distance education (Macias et al., 2021);
- the principle of individualization of didactic actions of education explorers;
- didactic integration and differentiation of educational materials for students;
- the principle of continuity of educational activity of education seekers;
- didactic substantiation of the original level of professional training of educational space applicants;
- the principle of personal orientation of educational material;
- the principle of openness of education with remote access to electronic resources (Hu et al., 2023;
- the principle of cooperation on a productive basis between teachers and students;
- the principle of taking into account the peculiarities of the psychological and pedagogical direction of the educational activity of the students of education with remote access to electronic educational resources;
- the principle of educational reflection of the acquirers of the educational space (Gong, 2023).

The outlined principles of didactics of innovative education emphasize: the clear direction of electronic educational resources that are constantly being created and improved, the integration into the national educational space, the integration into regional information environments of higher education, the clear observance of the laws of pedagogical science, the principles of didactic design of various information educational facilities, on unified methodological approaches in combination with high-quality software and pedagogical tools, software and technical characteristics, modern computers and ICT (Yahupov et al., 2019).

The results of the first survey showed that the most important motivation for quality education of students is the use of informatization in higher education. Here, students consider the main motives of their future professional activity to be: professional and valuable (18.3%); social (15.6%); cognitive (13.4%), and then communicative and aesthetic. The most unpopular answer turned out to be utilitarian-cognitive (5.6%) and status-positional (6.5%). It should be noted that unconscious motives also have average indicators, this indicates that not all students understand the motives of informatization of higher education, ways of identifying the main criteria for selecting means of organizing the educational process; the application of the basic didactic principles of education and the distance format, how pedagogical interaction is built for the effectiveness of the educational process, the essence of the most accessible and effective online education projects today, etc.

When working on eliminating these gaps, the second survey showed the following results: professional-value motives (25%) have growth dynamics, which shows the positive influence of professional influence when studying all subjects of the work program, social motives are also preserved mainly with 15.1%. Traditional historical motives receive 13% out of 100, and cognitive ones show a decrease. The low percentage of answers remains due to status-positional and utilitarian-cognitive motives.

The results of the third survey, before studying the courses, where attention is paid to the motives of informatization of higher education, ways of identifying the main criteria for selecting means of organizing the education; the application of the main didactic principles of education and the distance format, how pedagogical interaction is built for the effectiveness of the education, the essence of the most accessible and effective online education projects in the future professional activity, showed that professional and value motives (39%) receive a greater percent of all, traditional-historical and social motives moved to the second place with 12%. This distribution shows that after the professional courses of study, the students have already formed a stable position towards the assimilation of the informatization of higher education, ways of identifying the main criteria for selecting means of organizing the educational process; the application of the basic didactic principles of education and the distance format, the essence of the most accessible and effective online education projects today, they already firmly understand the role of ICT in their future professional activity. Social motivation says that students do not separate the knowledge they receive from their benefit to society.

The fourth poll showed a tendency to increase indicators in the professional-value (48.4%) and social (13.2%) motivational categories. This indicates an increase in students' understanding of the role of ICT and that the courses conducted were not without results – low indicators in the utilitarian-cognitive and unconscious categories of motives. The reduction of unconscious motives is a positive result for us, since the number of students who do not understand why they study the ways and motives of informatization of higher education, ways of identifying the main criteria for selecting means of organizing the educational process; the application of the basic didactic principles of education and the distance format, the essence of the most accessible and effective online education projects today, is reduced.

Below you can see the dynamics of the determination of motives from the first to the fourth survey. Thus, it has been proven that students' motivation to study ICT, informatization of higher education, to consider ways of identifying the main criteria for selecting means of organizing the educational process; to the application of the main didactic principles of education and the distance format, to the clarification of how pedagogical interaction is built for the effectiveness of the educational process, the clarification of the essence of the most accessible and effective online education projects today has a dynamically growing character, which is caused by the courses developed by us on the formation of readiness to use ICT and informatization of higher education in professional activities throughout life.

The second stage of the study was “Self-assessment”, where students assessed their knowledge before and after professional courses (before and after the 1st and 2nd semesters). The groups were divided into experimental (EG) and control (CG). Categories of questions from A to D.

Answer category:

A – of course I know and can teach;
B – I’ll sit down at the computer and remember;
C – I present in general terms;
D – I don’t know.

For the convenience of processing the results, the questions are divided into categories to understand which categories students have difficulty mastering. The numbers are given as percentages. The table of results before the experiment shows the initial level of knowledge and skills in information technology in two groups at once (CG and EG) since the results of the two groups were combined.

Table 1.
The result of the self-test of the CG and EG groups.

Category of questions	**A**	**B**	**C**	**D**
Operating system skills	58,4	18,4	8,9	14,2
Checking the ability to work with a text editor; clarifying the essence of the most accessible and effective online education projects today	40	20	17,1	22,9
Spreadsheet skills	29,2	20	16,7	35
Skills in working with presentation programs	27,7	19,2	16,9	36,2
Database skills	13,3	8,3	6,7	71,7
Internet skills	20	12,5	13,3	54,2
Working with Images	19	15	12	54
Website construction	10,7	7,1	2,9	79,3

*The table is compiled by the author

The table shows that in the first two categories, students rate their knowledge well, and then the categories below have poor results; the majority rate their knowledge of skills in working with databases, with images and building websites very low. This means that the emphasis on developing and teaching undergraduate courses should be on these categories.

Work was done to find effective ways to improve higher education, and it was considered a factor in the global informatization process. The main features of modern society and the main trends that change the image of education are highlighted. The key models of the educational process, including in the distance format, which are built based on network computer technologies, are considered. For quality education, the main criteria for selecting means of organizing the educational process are identified; the main didactic principles on which pedagogical interaction is built for the effectiveness of the educational process; several didactic principles specific to education were formed. Emphasis is placed on the positive features of modern education, which show its character, and the features that contribute to higher education, making it perfect and innovative, are highlighted.

After the work was done, significant changes were observed in the EG. The percentage of students who think they have no spreadsheet skills is 3.3%, while those who have complete knowledge is 47.1%. The problematic categories of questions, in our opinion, were “Skills in working with databases” and “Building websites”, to which, before we improved the courses, a large number of students answered “I don’t know” and the percentage of those who did not know reached 71.7% (skills in working with databases) and 79.3% (website construction). After studying the courses we improved, these figures dropped to 15.7% (database skills) and 20.7% (website building). A table comparing the two groups can be seen below:

Table 2.
Comparison between the two groups after the experiment

Categories of questions	Before the experiment	After the experiment	
	In both groups	KG Group	EG Group
Operating system skills	58,4%	60,1%	68,2%
Checking the ability to work with a text editor; clarifying the essence of the most accessible and effective online education projects today	40%	41,3%	63%
Spreadsheet skills	29,2%	31,1%	53,1%
Skills in working with presentation programs	27,7%	41,3%	69,4%
Database skills	13,3%	20,5%	45%
Internet skills	20%	29,2%	57,1%
Working with Images	19%	32,3%	51,6%
Website construction	10,7%	17,3%	50,5%

*The table is compiled by the author

Quantitative indicators are given only for answer category A (of course I know and can teach), since this category of answers provides more accurate data on students’ opinions about their abilities and skills in working with information technology, including in a distance format, as a factor in the global process Informatization of high light.

The table shows that the percentage of those who believe that they know how to work with an operating system can work with databases, and images, and can create web pages increased in both groups, but in the EG group, the percentage increased significantly. For example, while the percentage of those who knew and could work with spreadsheets was 29.2%, after our work in the control group the percentage was 31.1%, and in the experimental group 53.1, which is 22% higher.

For the purpose of our research, the methodology of R. Cattell was applied. After conducting an empirical study, the relationship between the personal characteristics of active students of student age was revealed. The data obtained according to R. Cattell's multifactor personal method correspond to the law of normal distribution, therefore, the method of one-factor variance analysis was used, which was used to calculate the level of significance of the differences between the obtained indicators in the two groups. The probability of disagreements was assessed by blocks of personal characteristics: communicative, intellectual, emotional (Ihorovich, 2018).

The experiment showed an undoubted dynamics of growth in the development of students' knowledge and skills in informatization, up to the consideration of ways of strengthening the main criteria for selecting methods for organizing the initial process; before the basic didactic principles of the education and distance learning format are established, before the directions on which there will be pedagogical interaction to ensure the effectiveness of the education process, taking into account the essence of the greatest available and Highlight the effectiveness of today's online projects. Thus, we can say with confidence that the work has been completed, both healthy and necessary.

Conclusions

The role of education considered as a factor in the total development of informatization of higher education. The main features of the information society and the key trends that change the image of education are highlighted. The chief models of the education as a factor of the global process of informatization of higher education, which are built based on network computer technologies, are considered.

For high-quality education, the chief standards for selecting means of e-learning organization are highlighted; basic didactic principles on which pedagogical interaction is built with the aim of effective distance learning; and several didactic principles specific to innovative education were formed. Emphasis is placed on the optimistic structures of higher education, which show its character, distinguish features, and contribute to the worldwide development of informatization of higher education, making it perfect and innovative.

A survey of students of various specialties in institutions of higher education was conducted to find out the main ways of global quality training of future competitive specialists in the innovative process of higher education.

The prospects for the development of modern education and the ways and means of education, which allow for a complete restructuring of the educational sector, improve and even change the educational process, are considered. The essence of today's most accessible and effective online education projects is revealed.

The value of independent work in modern education is shown as a factor in the global process of innovativeness of higher education in a distance format, which is a motivation for independent expansion and deepening of acquired knowledge.

Further research will focus on ways to update online distance education projects.

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Artificial Intelligence in higher education: opportunities and challenges

Штучний інтелект у вищій освіті: можливості та виклики

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Abstract

The article reveals the meaning of the concept of artificial intelligence and proves the necessity of its application in the educational space. The purpose of the article is to show the importance of artificial intelligence as an educational and entertainment tool in higher education. The methodological concept is aimed at ensuring the effectiveness of students' education with the help of artificial intelligence. The research results show the types (weak and strong), directions, functions of artificial intelligence; the importance of edutainment in higher education and its main principles are revealed. Artificial intelligence is presented as a toolkit of edutainment in higher education and the importance of using artificial intelligence functions for edutainment in US higher education to improve human skills and abilities is shown. The significance of the avatar and virtual teacher in the educational process is revealed. During the

Анотація

У статті розкрито зміст поняття штучного інтелекту та доведено необхідність його застосування в освітньому просторі. Метою статті є показати важливість штучного інтелекту як освітньо-розважального інструментарію у вищій освіті. Методична концепція спрямована на забезпечення ефективності навчання студентів за допомогою штучного інтелекту. У результатах дослідження показано типи (слабкий та сильний), напрями, функції штучного інтелекту; розкрито значення едютейнменту у вищій освіті та його основні принципи. Штучний інтелект представлено як інструментарій едютейнменту у вищій освіті та показано важливість використання функцій штучного інтелекту з метою едютейнменту у вищій освіті США для вдосконалення навичок і здібностей людини. Розкрито значущість в освітньому процесі аватара і віртуального

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research and experimental work, we singled out the leading factors of the actualization of the ideas of artificial intelligence as an educational and entertainment toolkit in the modern theory and practice of training students of higher education.

Keywords: Artificial Intelligence, edutainment, higher education, virtual teacher, virtual reality, neural networks.

викладача. Під час дослідно-експериментальної роботи ми виокремили провідні чинники актуалізації ідей штучного інтелекту як освітньо-розважального інструментарію в сучасній теорії та практиці підготовки здобувачів вищої освіти.

Ключові слова: штучний інтелект, едютейнмент, вища освіта, віртуальний викладач, віртуальна реальність, нейронні мережі.

Introduction

Nowadays, there is an active improvement and updating of the created unique, potentially innovative digital systems in engineering, which process information, and apply the results of this information processing to promote the improvement of innovative digital systems in today's educational space. It is precisely such fantastic advanced projects that approach the capabilities of human intelligence and are actively becoming a reality today. Artificial Intelligence is an element of the modernization of the education system, the development of Society 4.0, taking into account modern achievements, and mastering the latest practices by teachers (Shyshkina & Nosenko, 2023). We emphasize that the use of Artificial Intelligence significantly increases the productivity of educational activities. In global practice, particularly in education, the share of using machines and programmed systems instead of humans is constantly increasing due to pandemics, economic benefits, natural disasters, military conflicts, etc. Over time, this trend may lead to a partial or complete replacement of a person as a teacher due to the rapid development of Artificial Intelligence and information and communication technologies. But, the advantage is that, if used correctly, such technologies in higher education expand the possibilities of research, human abilities, learning, and teaching (Kulieshov, 2022).

So, today, Artificial Intelligence systems open up new opportunities for teaching and learning in higher education, but they are not yet ready to completely replace teachers. Edutainment in higher education, that is, education in the form of a game, in an entertaining format, a game mechanism, motivates students of higher education to pass educational tests, perform creative tasks, better navigate the studied material, and understand complex topics. Edutainment in higher education is appropriate in any class and guarantees the quality of the educational space precisely in the game format to master the basics of literacy and develop critical thinking. Therefore, the issue of Artificial Intelligence as an edutainment toolkit in higher education requires careful analysis and research from an academic point of view.

Traditional approaches to the information activity of higher education institutions have lost their effectiveness and can no longer meet modern requirements. New approaches, new concepts of digital transformation of higher education institutions are needed. Approaches that will allow to combine all the processes of creation and use of software and information tools for the construction of digital universities. Therefore, an urgent scientific task arises, which consists in the development of methods and models of digitalization of higher education institutions based on artificial intelligence.

In the article, we considered the following main aspects: the content of the concept of Artificial Intelligence and the need for its application in the educational space; types and directions of artificial intelligence; the importance of edutainment in higher education and the main principles that should ensure the implementation of the task of "Edutainment" technology; Artificial Intelligence as a toolkit of edutainment in higher education; functions of Artificial Intelligence in higher education; the use of Artificial Intelligence functions for edutainment in higher education in the United States to improve human skills and abilities; the importance of edutainment in education; a new direction in the development of artificial intelligence, and edutainment in higher education – the involvement of virtual reality and the use of video lessons with a virtual teacher; stages of creating a teacher's avatar; neural networks for creating a variety of content in classes in institutions of higher education.

Purpose of the article. To show the significance of Artificial Intelligence as an edutainment toolkit in higher education.

Literature review

As a specific scientific phenomenon, Artificial Intelligence as a toolkit of edutainment in higher education was studied by scientists in various contexts of psychological and pedagogical research, thanks to which the place and role of Artificial Intelligence in the system of sciences was substantiated, the specificity of the conceptual and conceptual apparatus of Artificial Intelligence as a toolkit of edutainment in higher education was characterized.

S. Kulieshov's (2022) research on the development of an Artificial Intelligence system, which significantly increases the productivity of educational activity and analysis of its opportunities for learning and teaching in higher education in the USA, is interesting and significant. Such a trend in the educational space, thanks to the rapid development of Artificial Intelligence and information and communication technologies, may eventually lead to the replacement of a person as a teacher. Based on Artificial Intelligence and a neural network, O. Kaliuzhna (2023) developed approaches that have great prospects for improving teaching in higher education (using personalization in combination with comprehensive access databases, and adaptive learning environments, supporting the development of critical thinking.
D. Borysenko (2023) attaches particular importance to the creation of adapted digital platforms to the combination of Artificial Intelligence and virtual reality for in-depth professional training of specialists. The scientist highlighted the trending directions of achievements in the development of artificial intelligence, showed their prospective implementation possibilities, and trends in the development of Artificial Intelligence and digital transformation.

Many authors emphasize that one of the most important components of the development of modern information technologies is the creation and use of artificial intelligence systems. The demand for such technologies is growing rapidly. Scanning and text recognition systems are actively being developed and implemented; urgent problems of creating computer dictionaries of national languages, machine translation from one language to another, etc. This is primarily related to the development of the global Internet information network and the increase in the level of computerization of management of all spheres of human life. Artificial Intelligence as a toolkit of edutainment in higher education is considered by O. Zahorodnia, A. Vornachev & M. Horiunova (2022). In particular, they offer functions performed by Artificial Intelligence in the study of disciplines: measurement of learning progress, personalization, easy integration, and motivation. Scientists define edutainment as a necessary component of effective learning through the use of various forms of work and interactive methods of the educational process – "taking into account the psychological needs of students through traditional and electronic books, music, films, educational games, computer and video games, electronic simulators, encyclopedias, web-quests, wikis, and blogs", which are necessary for an effective educational globalization space. I. Sukhopara & M. Tymoshchuk (2021) show the advantages of educational, exciting, cognitive, and emotional technology of edutainment for the modern educational process, which requires dynamic forms of teaching and leads to satisfaction, and active independent work of education seekers. O. Hrytsiuk, V. Chernenko & L. Maksimova (2021) considered the possibilities and features of edutainment in computer science classes, investigated the state of implementation of edutainment in educational institutions, developed recommendations for the introduction of game practices into the educational process.

So, we see that Artificial Intelligence as a toolkit of edutainment in higher education has been studied by scientists in various contexts of psychological and pedagogical research (the specificity of the conceptual and conceptual apparatus of Artificial Intelligence is characterized, the role and place of Artificial Intelligence in the system of sciences is substantiated, the toolkit of edutainment in higher education is shown). The implementation of edutainment in the educational process of a higher school will contribute to the reduction of psychological tension and can significantly increase the motivation of students of higher education, and their cognitive activity to study the subject.

Scientists A. Valencia Tafur & R. Figueroa Molina (2023) consider the issue in their article the scientific production on the impact on education of technologies related to Artificial Intelligence.

Sanabria-Navarro, Y. Silveira-Pérez, D. Pérez-Bravo & M. de-Jesús-Cortina-Núñez

(2023) Emphasize that the application of AI in education worldwide has increased dramatically with its importance growing at an increasing rate. The objective of this research is to bibliometrically analyze applications of AI in contemporary education. The systematic literature review of recent works employed a mixed approach using quantitative and qualitative methods. It was inferred by the authors that AI is revolutionizing education by offering personalized and efficient solutions to improve students' learning. One of the main conclusions of this research is that in contemporary education, students are one of the groups that are most affected by AI. Troncoso Heredia, M. O., Dueñas Correa, Y. K., & Verdecia Carballo, E. (2023) draw attention to Artificial intelligence is capturing the attention of the community in general and the scientific community in particular, based on all the potential it has to facilitate certain processes of daily life. Hence, the objective of this article is focused on evaluating how artificial intelligence has impacted teaching, learning and the areas of administration and management of education. Artificial intelligence is capturing the attention of the community in general and the scientific community in particular, based on all the potential it has to facilitate certain processes of daily life.

However, the rapid dynamics of the development of the world market of information technologies in the conditions of globalization formed a scientific problem regarding the development of artificial intelligence in education. Highlighting global threats and challenges along with the need to develop international, regional and national regulatory measures for the development of the world market of information technologies is an urgent task of today's scientific research.

Analyzing scientific works in the field of artificial intelligence in the conditions of globalization, it should be noted the limited attention of the authors to the global problems of artificial intelligence in educational institutions, which determined the choice and focus of the topic of our article.

Methodology

The methodical concept of the study is aimed at ensuring the effectiveness of student training with the help of artificial intelligence: a complex of didactic and methodological support (diagnostic, educational and methodological, monitoring, technological), aimed at the realization of the set goals and objectives, raising the educational level. education seekers, the choice of forms and methods that were aimed at implementing and ensuring the process of improving educational services and the quality of education.

The following methods were used in the article:

- theoretical: concretization, synthesis, analysis, systematization, comparison, generalization of the provisions of the materials of psychological, philosophical, and pedagogical studies to substantiate the identified factors of actualization of the practical value and theoretical significance of Artificial Intelligence as a toolkit of edutainment in higher education, for quality training of students of higher education and its modernization, as well as revealing the specifics of Artificial Intelligence as a toolkit of edutainment in higher education; comparative analysis of educational-scientific and educational-professional programs; analysis and generalization of materials of higher education sites, educational and methodological support of institutions of higher education to clarify the manifestation of the real state of application of Artificial Intelligence in the process of training students of higher education;
- empirical: diagnostic conversation, questionnaires, interviews with the aim of revealing the degree of awareness of the subjects of higher education of the goals, essence, significance of the methods of implementing Artificial Intelligence as a toolkit of edutainment in higher education during the organization of specialist training; psychological-pedagogical observation of management methods, methods of interaction, management of educational activities of higher education students, analysis of the content of independent tasks with the aim of fixing the applied means of Artificial Intelligence as a toolkit of edutainment in higher education, revealing changes in their acquisition of information culture as an important professional new formation of the personality; a pedagogical experiment during the modernization of the training of higher education applicants based on the application of an innovative approach, by introducing Artificial Intelligence as an edutainment toolkit in higher education;
- methods of mathematical statistics – for processing the empirical facts obtained in

the process of the experiment, checking the effectiveness of the experimental work.

The research was carried out in 2 stages.

At the first stage, an analysis of the experience of institutions of higher education with the use of elements of Artificial Intelligence as a toolkit of edutainment in higher education was carried out, the purpose and strategy of the research were identified, the scientific apparatus was specified, the scientific problem of the introduction of Artificial Intelligence as a toolkit of edutainment in higher education was identified, an analysis of scientific literature was carried out;
At the second stage, an experiment was conducted to reveal the current state of training of higher education seekers based on the introduction of Artificial Intelligence as an edutainment toolkit in higher education, the obtained results were summarized, and general conclusions were formulated.

The total sample size is 208 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The reliability and validity of the obtained results, the objectivity of their assessment was ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

As a result of the research, we obtained the following results. Out of 208 higher education students surveyed, 177 have already used at least one of the Artificial Intelligence tools as an edutainment toolkit in higher education in the last 6 months. 76% of higher education students have used Artificial Intelligence at least once, and more than half of them had a positive interaction experience. Every second respondent believes that Artificial Intelligence will change the educational process of higher education in the coming years; therefore, respondents indicate that they use Artificial Intelligence services in their activities to create homework tests, prepare for classes, practice, and monitor knowledge.

The study proved the importance of using Artificial Intelligence as an edutainment toolkit in higher education and showed that Artificial Intelligence is an essential technology for education, which is not measured by the criteria of useful or harmful, good or bad; everything depends on who and how they use them and keep in focus the important role of the future highly qualified modern specialist.

Results and discussion

1. The content of the concept of Artificial Intelligence and the need for its application in the educational space.

Among the main modern innovation trends in the educational space is the involvement of Artificial Intelligence as a tool for edutainment in higher education. It is a property of engineering systems, and not even a technology, to involve acquired experience in education, it is a kind of educational model in the education system, that can improve, adapt, and process large amounts of information based on improved approaches and mechanisms.

"Artificial Intelligence is a set of automatic methods and means of purposeful processing of information (knowledge) by the experience gained in the process of learning and adaptation when solving all kinds of intellectual problems" (Zahorodnia et al., 2022). "The involvement of Artificial Intelligence in professional education is the creation of personalized training for future specialists, which includes modern learning strategies, takes into account the individual differences of each student and the peculiarities of professional training for each field, the specification and use of big data resources, the use of adaptive tools and constant control over achievements of participants in the educational process" (Borysenko, 2023).

2. Types and directions of artificial intelligence.

There are two types of Artificial Intelligence – weak and strong.

Weak, involves the possibility of performing a narrow list of tasks. For example, these can be mobile applications Siri and Google Assistant for voice control, which provide voice commands to the operating system provide an opportunity to receive a clear, understandable answer, and perform certain educational functions to ensure quality education.

Strong Artificial Intelligence is aimed at performing any task that a person needs to perform, however, such an Artificial Intelligence system has not yet been created, but developments in this direction are constantly being carried out (Kuchai, 2021; Viktorova et al., 2021).

3. The importance of edutainment in higher education and the main principles that should ensure the implementation of the task of "Edutainment" technology.

Edutainment in higher education is important. It is defined as digital content that combines entertainment and educational elements, providing audience information with the most simplified analysis of events (Kuchai et al., 2020).

Tasks from the "Edutainment" technology must comply with three principles (connection between theory and practice, accessibility and consistency):

– to achieve the principle of connection between theory and practice, it is recommended to provide the educational process with dialogic communication and the study of practice-oriented topics. Research and problem-finding tasks are an effective means of connecting practice and theory. There can be real-world examples supplemented by theoretical problems;
– the principle of accessibility ensures that the material is presented from simple to more complex, provides for the correspondence of the age of the student to the difficulty of the tasks;
– the principle of consistency requires bringing the system of knowledge to a high level, therefore it is necessary to return to the studied material and consider new topics based on it.

Edutainment in education involves learning taking into account the psychological needs of students of higher education through computer and video games, music, films, e-books, educational games, network versions of museum exhibitions, electronic simulators, wikis, encyclopedias, blogs (Zahorodnia et al., 2022).

4. Artificial Intelligence as a toolkit of edutainment in higher education.

Complex computer systems use machine learning algorithms in the educational space. They serve higher education learners of all types of abilities and are involved to some extent in the human educational processes and complex processing tasks used in higher education learning and teaching using the toolkit of edutainment in higher education. The importance of using such systems in the educational space stimulates the giants of the IT industry, Apple and Google, and encourages them to invest heavily in projects to create new forms of artificial intelligence.

The role of Artificial Intelligence in education is to expand the educational process, and to improve human thinking because education is not a technology-oriented solution, but an exclusively human-centered activity.

Teaching future specialists to work with Artificial Intelligence systems is the main task of higher education institutions because it is Artificial Intelligence that provides the opportunity to use sources of information, and manage them, and therefore is a tool with a large number of possibilities, which is a relevant issue for the modern world, because the Internet has a large impact on society, includes many media tools for shaping public opinion and combines a huge number of information repositories (Kulieshov, 2022).

5. Functions of Artificial Intelligence in higher education.

Let's find out what functions Artificial Intelligence can perform in higher education:

1) automation of repetitive or basic actions – automated evaluation for testing with filling in gaps and choosing answers of higher education applicants;
2) detection of shortcomings and gaps in the educational program – with the help of, for example, a system such as Coursera (e-learning platform), it is possible to notify about wrong answers of a large number of higher education applicants or problems of students' assimilation of material on a certain topic;
3) personalization of educational platforms – Artificial Intelligence uses adaptive educational programs, edutainment in higher education, and software taking into account the individual needs of students of higher

education to create an educational environment. Personalization ensures the completion of educational tasks of varying complexity and at one's own pace; data analysis of higher education applicants and their comparison with the parameters of other higher education applicants. The more data the Internet user transmits about himself, the more personalized the content of the training program will be.

4) virtual tutors – artificial intelligence-based tutoring systems using edutainment tools in higher education;
5) new ways of interacting with educational information – higher education students gain new opportunities for research with the introduction and development of new technologies;
6) feedback channel for teachers and students of higher education – Artificial Intelligence systems using edutainment tools in higher education can monitor the progress of students of higher education and notify teachers about their possible problems;
7) new dynamics with teachers – since Artificial Intelligence is becoming more and more integrated into the education system, using edutainment tools in higher education, teachers can supplement classes with tasks with variable solutions;
8) new ways for training, recruitment, and support – through intelligent data collection, the Artificial Intelligence system can provide recommendations and information to improve the lives of higher education applicants and the work of higher education institutions themselves;
9) reduction of social and academic pressure – an environment is created for students of higher education where they do not feel pressure, but are equal co-organizers of the educational environment, comparing themselves with their colleagues.
10) accessibility of education – in combination with an Internet connection, software, Artificial Intelligence systems, and support allows higher education seekers to study at any time and from anywhere in the world (Goddard, 2020);
11) motivation – involves the study of any material from a practical point of view, where the result is visible from the first execution of the task. It is important during training not to forget about game elements that inspire higher education students to master professional skills in the long term;
12) measuring the progress of the educational field – makes it possible to track the progress of a higher education student in the development of reading, pronunciation, and writing skills;
13) easy integration provides the future of Artificial Intelligence in the field of education through customized products, but it is worth considering the data privacy policy (Zahorodnia et al., 2022).

6. The importance of edutainment in education.

Acquaintance with new game technologies, distribution, and generalization of best game experience, creation of a safe and interesting environment in education, which ensures the constructive development of a student of higher education is the main task of modern higher education. It is edutainment that allows students of higher education to be taught constructive communication skills, to reduce tension in the socio-cultural development of students, and to preserve the culture of their communication. Game practices in the field of education turn on involuntary attention, with the help of which students remember educational material better (Hrytsiuk et al., 2021; Kulieshov, 2022).

Quite controversial in education is edutainment, one of the global educational trends, which is education in the form of a game, in an entertaining format. The game mechanism greatly motivates students of higher education to complete independent tasks, pass educational tests, understand complex topics, and facilitate orientation in the studied material. Educators advise developing critical thinking and mastering the basics of financial and educational literacy precisely in the game format. For students of higher education, it does not matter how the information is presented, the main thing is that it does not turn into a dead dogma. Web quests, science parks, book trailers, animated educational videos, and emoji stories are powerful tools for learning it. An important essence of edutainment is a story with the integration of games and learning and entertainment elements in a language that is understandable and accessible to students. The main message of edutainment in education is "Learn by playing!". And Artificial Intelligence is a toolkit of edutainment in higher education. Modern technical means make a student's sense of satisfaction synonymous with learning. But edutainment requires a restructuring of the mental thinking of both higher education students and teachers, for whom it is difficult to understand that it is also possible and necessary to "play" in higher education institutions (Pedrada, 2022).

Edutainment has absorbed all the best from such fields of knowledge as psychology (communicative theories); pedagogy (pedagogical principles); and informatics (modern communication and information technologies) (Shetelya et al., 2023). Scientists consider edutainment broadly, considering it a type of educational process that is not only related to the entertainment mechanism but also takes into account other processes (Stratan-Artyshkova et al., 2022). For example, entertainment is only the first stage of using edutainment, and the ultimate goal of the educational process of higher education is passion for the subject, sustained interest in education (Aksakal, 2015).

7. A new direction in the development of artificial intelligence, and edutainment in higher education – the involvement of virtual reality and the use of video lessons with a virtual teacher.

For a high-quality educational process that improves visualization and learning productivity, there is a new direction in the development of artificial intelligence, and edutainment in higher education – involving virtual reality. The use of virtual reality in a new-level educational environment, where real professional situations are simulated with a large number of probabilities, makes each task unique, and the educational situation as realistic as possible both in the visual context and procedurally. In the process of innovative didactic design, the use of Artificial Intelligence for the teacher demonstrates the new potential of the main advantages and opportunities of the virtual environment. This approach traditionally creates virtual classrooms, and online rooms with digital support, where the teacher is only a supervisor. In institutions of higher education, using artificial intelligence, projects have been developed that create conditions for the organization of the base, the formation of new educational scenarios, for a new model of cardinal interaction, which combines variations that are combinatorial for all possible implementations with the addition of the main properties – diversity, volume, truthfulness, and speed (Borysenko, 2023).

Higher school practitioners have proven that technical achievements in the educational process, such as digital laboratories, VR glasses, and virtual classes are impressive. But they play a supporting role. Because only university teachers create a culture that energizes and motivates higher education students, their position and role in the group of students is constantly changing, but it is necessary in education (Pedrada, 2022).

Today, new approaches and means of the educational process are needed, which are capable of reorganizing higher education institutions in the era of Education 4.0 development (Polishchuk et al., 2022).

8. Avatar and virtual teacher. Stages of creating a teacher's avatar.

The difference between a virtual teacher and an avatar is that the avatar, during lectures, is a "representative" of the teacher. During consultations, the virtual teacher explains the material in video materials, when he presents the image of the teacher in a virtual form.

Creating a teacher avatar has several stages and is a complex process.

The first stage is the development of the avatar concept, which involves determining the characteristics of the avatar, its functionality, appearance, etc. For example, an avatar can have the possibility of interactive communication with students and can be created in the form of an abstract character or a real teacher.

The second stage is the creation of an avatar model in an educational institution. For this, special programs are used, which ensure the creation of a 3D model of the avatar and adjust its animation and appearance. Necessary for this stage is the development of an interface that allows higher education students to interact with the avatar.

The third stage is integration into the educational system of the avatar. For this, it is important to configure interaction with other elements of the avatar system (with text chat, drawing board, etc.).

The fourth stage is the optimization and testing of the avatar. The stage provides conditions for conducting testing in the real conditions of the educational process for the workability and effectiveness of the avatar; allows you to eliminate possible errors; and performs optimizations that contribute to the improvement of avatar performance (Bozhko, 2023).

9. Neural networks for creating a variety of content in classes in institutions of higher education.

Artificial Intelligence as an edutainment toolkit in higher education has revolutionized our approach to higher education.

Neural networks are also a popular tool in the education industry, providing the ability to analyze vast amounts of data and recognize patterns.

We will give examples of the use of different neural networks in classes at a higher school:

1) word embedding: a type of neural network that transforms words based on their context in the text into numerical vectors. This technique was used by analyzing the common use of certain words in the text to identify themes in the literature;
2) mood analysis: the use of neural networks in higher education provides for mood analysis, which makes it clear how the teacher uses syntax and diction, conveys emotions (sadness, joy, fear, anger), provides for the use of machine learning algorithms to classify the emotional tone of written texts;
3) transfer of style: neural networks are used to transfer style between genres, and different literary works;
4) designation of authorship: in cases where it is difficult to determine the author of the work due to anonymous publication or there is no information about authorship; analyze linguistic features; to determine authorship with sufficient accuracy, it is worth applying neural networks to solve this problem by using a dictionary and sentence structure.

These examples demonstrate the versatility of neural networks when applied in higher education. In general, the introduction of such technologies as Artificial Intelligence into higher education contributes to better understanding among students of higher education, at the same time ensuring trends in the involvement of students in making more informed decisions regarding the choice of educational material, etc. (Kaliuzhna, 2023).

10. Experimental study.

To clarify the importance of Artificial Intelligence as a tool of edutainment in higher education, we revealed the meaning of the concept of Artificial Intelligence and proved the necessity of its application in the educational space. Types (weak and strong), directions, and functions of Artificial Intelligence are considered; the importance of edutainment in higher education and its main principles are revealed. Artificial Intelligence is presented as a toolkit of edutainment in higher education and the importance of using Artificial Intelligence functions for edutainment in US higher education to improve human skills and abilities is shown. The need for a new direction in the development of Artificial Intelligence is shown – the involvement of virtual reality and the use of video lessons with a virtual teacher. The significance of the avatar and virtual teacher in the educational process is revealed. The stages of creating a teacher's avatar and the role of neural networks in creating a variety of content in classes at higher education institutions are shown.

Artificial Intelligence as an edutainment toolkit in higher education has revolutionized our approach to higher education.

11. Organization and main stages of research.

The research was carried out in stages.

At the first stage, an analysis of the experience of institutions of higher education with the use of elements of Artificial Intelligence as a toolkit of edutainment in higher education was carried out, the purpose and strategy of the research were identified, the scientific apparatus was specified, the scientific problem of the introduction of Artificial Intelligence as a toolkit of edutainment in higher education was identified, an analysis of scientific literature was carried out;
At the second stage, an experiment was conducted to reveal the current state of training of higher education seekers based on the introduction of Artificial Intelligence as an edutainment toolkit in higher education, the obtained results were summarized, and general conclusions were formulated.

12. Empirical facts obtained during research and experimental work.

During the research and experimental work, we singled out the leading factors of the actualization of the ideas of Artificial Intelligence as an edutainment toolkit in the modern theory and practice of training students of higher education, including:

– affirming the priority of the concept of continuous education as a modern

anthropocentric paradigm, which is based on the humanistic idea of the necessity and expediency of lifelong learning, because it should become a natural part of life at any age;
– the rapid development of Artificial Intelligence as a purposeful and specially organized process of socio-cultural production of the personality through the implementation of educational and informational activities outside and within the boundaries of higher education, implementation of educational services and programs;
– social recognition of the achievements of Artificial Intelligence as a toolkit of edutainment in higher education, which reveals the regularities of organization, design, and support of the learning process of the student of education, taking into account his educational needs and age characteristics, capable of self-actualization, self-realization, and self-development.

As a result of the research, we obtained the following results.

Out of 208 higher education students surveyed, 177 have already used at least one of the Artificial Intelligence tools as an edutainment toolkit in higher education in the last 6 months.
76% of higher education students have used Artificial Intelligence at least once, and more than half of them had a positive interaction experience.

Every second respondent believes that Artificial Intelligence will change the educational process of higher education in the coming years; therefore, respondents indicate that they use Artificial Intelligence services in their activities to create homework tests, prepare for classes, practice, and monitor knowledge.

In classes, Artificial Intelligence is actively used by teachers from exact disciplines (physics, computer science, mathematics), and humanities – history, English language, literature, etc.

What was interesting during the experiment was that there was a dependence: the shorter the teacher's work experience, the more active he is in using Artificial Intelligence as a tool for edutainment in higher education.

Is an example of artificial intelligence in the first place in terms of popularity was a tool such as ChatGPT – a service that is the most popular among teachers and students. The level of knowledge about Artificial Intelligence as an edutainment toolkit in higher education is somewhat higher among students (81% of respondents) than among teachers (75% of respondents).

The second example of artificial intelligence in education is according to the level of popularity, the tool of Artificial Intelligence as an edutainment toolkit in higher education from the project "Na Urok" is in second place among the respondents. 58% of the interviewed teachers know about this service, and the level of knowledge among students is 45%. Both teachers and students of higher education are much less aware of such well-known international Artificial Intelligence services: Stable Diffusion, Bard Google, Grammarly, Midjourney, and Notion AI. It is interesting that those teachers who are familiar with the topic of Artificial Intelligence as an edutainment tool in higher education are not in a hurry to involve students of higher education in the use of technology. 37% of teachers involved students of higher education in using Artificial Intelligence as an edutainment tool in higher education, and 52% only plan to do so in the future.

When answering the question of the questionnaire about the desire to advise technology to students of higher education, 11% of the interviewed teachers do not plan to advise students to use Artificial Intelligence in education. Some of these interviewed teachers say they are skeptical of AI technology because of its imperfections.

They claim that Artificial Intelligence in training currently cannot replace a person in conscious decision-making or the creative process, and it is also not fully capable of knowing the context of the task that it is offered to solve; Artificial Intelligence sometimes makes mistakes: it provides data that may contain inaccuracies or may no longer be relevant, makes elementary logical errors, also Artificial Intelligence will indicate inaccurately or most often will not indicate the source of information, and the message to the source is very important for research work.

On the other hand, higher education seekers, for the most part, see a great benefit in using Artificial Intelligence as an edutainment tool in higher education. 89% of higher education graduates have used Artificial Intelligence in higher education at least once, and a third of these respondents do so at least weekly. Also, about 40% of respondents indicate that they used

Artificial Intelligence as an edutainment toolkit in higher education during classes. According to respondents, artificial intelligence, in most cases, helps them to systematize information, generate ideas for creative works, and quickly search for and summarize material.

Individual respondents, in the questionnaires, anonymously admitted to using Artificial Intelligence tools for writing (for preparing tasks from humanitarian disciplines). However, for this purpose, the respondents who were interviewed rarely use Artificial Intelligence tools in higher education.

The study proved the importance of using Artificial Intelligence as an edutainment toolkit in higher education and showed that Artificial Intelligence is an essential technology for education, which is not measured by the criteria of useful or harmful, good or bad; it all depends on who and how they use them and keeps in focus the important role of a highly qualified specialist who will have the opportunity to learn constantly, use Artificial Intelligence and develop throughout his life.

Artificial Intelligence affects the work of teachers and students of higher education and creates new professional challenges for them.

Educators have come close to the moment when Artificial Intelligence as a tool of edutainment in higher education, based on its knowledge and verification of learned material, can teach others, and not only learn itself. Already today, ChatGPT flawlessly prepares tests for self-checking, comments on the mistakes made by the student, and strictly evaluates the answers of students of higher education.

Conclusions

The role of Artificial Intelligence in education is to expand the educational process, and to improve human thinking because education is not a technology-oriented solution, but an exclusively human-centered activity.

Teaching future specialists to work with Artificial Intelligence systems is the main task of higher education institutions because it is Artificial Intelligence that provides the opportunity to use information sources, and manage them, and therefore is a tool with a large number of possibilities, which are an urgent issue for the modern world.

Today, new approaches and means of the educational process are needed, which are capable of reorganizing higher education institutions in the era of Education 4.0 development.

The main advantage of the development of such an education system is the use of video classes with a virtual teacher, which helps to diversify the explanations of infographic objects, draw the attention of students of higher education to the important points of the lecture, qualitatively improve the online learning process, and use the avatar of the teacher with the possibility of creating an attractive and interactive educational environment. The teacher's avatar provides higher education students with real-time support and individual assistance; it is used to create interactive classes, with the help of Artificial Intelligence for edutainment in higher education helps students better understand the material; and makes it possible to reduce the cost of education from an economic point of view.

To clarify the significance of Artificial Intelligence as a tool of edutainment in higher education, we revealed the meaning of the concept of Artificial Intelligence and proved the necessity of its application in the educational space. Types (weak and strong), directions, and functions of Artificial Intelligence are considered; the importance of edutainment in higher education and its main principles are revealed.

Artificial Intelligence as an edutainment toolkit in higher education has revolutionized our approach to higher education.

The study proved the importance of using Artificial Intelligence as an edutainment toolkit in higher education and showed that Artificial Intelligence is an essential technology for education, which is not measured by the criteria of useful or harmful, good or bad; it all depends on who and how they use them and keeps in focus the important role of a highly qualified specialist who will have the opportunity to learn constantly, use Artificial Intelligence and develop throughout his life.

We see further research in the clarification of new approaches and means of the educational process, which are capable of reorganizing higher education institutions in the era of Education 4.0 development.

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Exploring the integration of circular economy and digitalization: current research progress and trends

Explorando la integración de la economía circular y la digitalización: avances y tendencias actuales de la investigación

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Abstract

The European Union robustly advocates the circular economy model as a foundation for sustainable business growth. However, the adoption rate by businesses remains tepid. Simultaneously, the Fourth Industrial Revolution underscores digitalization's potential for transformation. Many studies point to the role of digital tools in accelerating the circular economy. However, the nexus between digital technology and circular economy principles is a budding and rapidly evolving academic area. While ample research addresses digitalization and the circular economy independently, holistic studies merging the two are limited. This article aims to dissect the current trajectory and future directions of research that integrates both domains, offering deep insights for subsequent scholarly explorations. We employed a bibliometric approach, extracting literature chiefly from the

Анотація

Європейський Союз рішуче підтримує модель циркулярної економіки як основу для сталого зростання бізнесу. Однак рівень впровадження бізнесом залишається низьким. Водночас Четверта промислова революція підкреслює потенціал цифровізації для трансформації. Багато досліджень вказують на роль цифрових інструментів у прискоренні циркулярної економіки. Проте взаємозв'язок між цифровими технологіями та принципами циркулярної економіки є новою академічною сферою, яка швидко розвивається. У той час як велика кількість досліджень стосується цифровізації та циркулярної економіки окремо, цілісні дослідження, які об'єднують ці два аспекти, обмежені. Ця стаття має на меті розібрати поточну траєкторію та майбутні напрямки досліджень, які об'єднують обидві сфери, пропонуючи глибоке розуміння для

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Web of Science database and applying VOSviewer software for keyword association visualizations. Our analysis encompasses varied aspects, from publication trends to interdisciplinary intersections and practical implementations.

Keywords: innovations, technology integration, collaborative methodologies, digitalization, circular economy, economic paradigms, emerging information technology, strategic blueprints, progress, trends, advanced data analytics.

наступних наукових досліджень. Ми застосували бібліометричний підхід, витягуючи літературу переважно з бази даних Web of Science і застосовуючи програмне забезпечення VOSviewer для візуалізації асоціацій ключових слів. Наш аналіз охоплює різноманітні аспекти, від тенденцій публікацій до міждисциплінарних перетинів і практичних реалізацій.

Ключові слова: інновації, технологічна інтеграція, спільні методології, цифровізація, циркулярна економіка, економічні парадигми, нові інформаційні технології, стратегічні плани, прогрес, тенденції, передова аналітика даних.

Introduction

The traditional economic paradigm is increasingly viewed as ill-equipped to craft a forward-thinking society. Overconsumption of vast natural resources has led to unforeseen and largely irreversible harm to both local ecosystems and the wider environment. Instead of elevating living standards, an expanding portion of the world's populace is fraught with uncertainties about the future. Given this context, the global discourse has pivoted towards sustainable development, perceived as the new road map to foster societal advancement. The circular economy is gaining traction as a potent strategy to embody the tenets of sustainable development, presenting an alternative to the conventional economic system by emphasizing resource renewal and prudent utilization (Murray et al., 2017).

The genesis of the phrase "circular economy" remains a topic of discussion. The circular economy is a production model that emphasizes the reuse of materials and the efficient consumption of natural resources (Greyson, 2007; Boulding, 1996). Thanks to this approach, a cyclical production process is achieved, maximizing the use of materials, and extending the product lifecycle (Liu et al., 2009; Yuan & Moriguichi, 2008). While the term "circular economy" is subject to varying interpretations, it's commonly perceived as a broad concept depicting a cyclical, self-sustaining system (Murray et al., 2017; Pearce &Turner, 1990).

In the modern era, the idea of a circular economy garners support from a lot of countries such as the European Union (EU), the United States of America (USA), the United Kingdom (UK), Asia countries, and numerous global businesses. The shared belief is that mutual efficacy is instrumental in guiding sustainable growth for enterprises (Hammer & Pivo, 2017). Such progression is attainable through integrating innovative business approaches and cultivating a sense of ecological responsibility.

Embracing the tenets of the circular economy comes with its set of hurdles. One prominent issue is the shifting of operational risks squarely onto the companies (Neely, 2008). When products are retained by businesses instead of consumers, there's a surge in upkeep expenses which may deter some customers (Rizos et al., 2016). Additionally, products designed for longevity in the circular economy, having elongated update cycles, may not align with fast-evolving technologies, potentially stalling advancements. As noted by Nobre (2017), the cyclic or closed-loop approach is gradually reshaping the dominant linear economic mindset. The traditional linear approach follows a pattern of produce, use, and discard. However, the circular framework upholds the 3-R ethos: 1) minimizing resource usage with a focus on renewables; 2) repurposing items to ensure optimal use; and 3) recycling, channelling waste, and residuals back into the economic stream (Millar et al., 2018).

The rapid strides in digital technology are widely acknowledged for their game-changing potential, often being hailed as the bedrock of the fourth industrial revolution (Bressanelli et al., 2018). Concurrently, the affordability and ubiquity of digital information and communication technologies (ICTs) have popularized the use of mobile computers, communication gadgets, global positioning systems, and the Internet. Notably, the Internet stands out as the linchpin of digitalization (Sturgeon, 2021). The foundational technologies and platforms propelling digitalization offer immense opportunities to boost productivity and enhance the global interconnectivity of consumers, workers, companies, and related sectors. Furthermore, they present robust instruments to foster innovation even in the most remote areas (Sturgeon, 2021). Thus, digital evolution is characterized by a fusion of advanced ICTs, digitalized knowledge, and web-based data, casting its influence over a vast spectrum of industrial and societal facets within the global landscape.

Furthermore, digital technology plays a pivotal role in bolstering the incorporation of the circular economy in enterprises (Bocken et al., 2016). Consider the Internet of Things (IoT) as an example. It equips businesses with the capability to remotely monitor live data related to their products' usage, condition, and location (Baines & Lightfoot, 2014), track materials throughout their life cycle using IoT tools, and facilitate the refurbishment of outmoded items. These innovations set the stage for a transition to a circular economy (Lewandowski, 2016).

In the realm of digital transformation, integrating process analysis with thorough data evaluation results in significant improvements in the management of storage, sales, and the performance of economic actions across varied sectors, technologies, machinery, products, and services (Liu et al., 2021). However, it's crucial to recognize that the intersection of the circular economy and digital technology is a nascent and rapidly evolving research area. While abundant studies focus on the circular economy and digital economy separately, there's a noticeable gap in research that interlinks these domains. Consequently, the purpose of this paper is to delve into the progress and trends in the confluence of the circular and digital economies, providing a foundation for future investigative pursuits in this specialized domain.

The objective of this research is to offer a detailed overview of scholarly works pertaining to Circular Economy (CE). Utilizing the Web of Science database, the researcher meticulously selected relevant publications, discarding those unrelated to the subject. The process involved sorting, organizing, and graphically displaying the information, culminating in a clear and structured narrative. The study poses several research questions, including:

1. What are the publication trends in CE over the past ten years?
2. What is the nature of author collaboration in CE research during this period?
3. What are the trends in CE titles over these ten years?

Literature review

Naudé (2011) expressed skepticism about the practicality of implementing Circular Economy (CE), considering it a challenging and unattained goal. The corporate sector often struggles with this implementation, facing hurdles such as:

- Physical resources like data, technology, and fundamental materials;
- Non-physical elements including a culture geared towards data, circular innovation, transparency, and collaborative creation;
- Skillsets related to systems thinking and data analytics (Kristoffersen et al., 2021; Aksoy & Hacioglu, 2021).

Despite these challenges, industry professionals persist in their efforts to incrementally apply CE principles. Kirchherr et al. (2017) identified CE as an amalgamation of reducing, reusing, and recycling practices. Potting et al. (2017) categorized the transition from a linear to a circular economy using a scale from R0 (refuse) to R9 (recover).

Carvalho et al. (2020) and Hislop & Hill (2011) highlighted CE's role in enhancing circularity, reducing energy and resource usage, and supporting sustainable resource management. Kirchherr et al. (2017) further noted that CE aims for long-term economic growth, environmental conservation, and social equity, benefiting future generations. CE encourages sustainable lifestyles and should influence strategies and policies grounded in sustainability (Unal et al., 2018). Akkalatham et al. (2021) discovered a link between recycling willingness, lean manufacturing, and CE efficacy. Environmentally responsible practices enhance productivity and necessitate continuous innovation, including efficient use of tools like pre-shredders and power plants, to conserve mineral resources.

Ghisellini et al. (2016) posited that successful CE implementation would significantly boost sustainable business and societal outcomes. This involves resource optimization during production, distribution, and consumption (Kirchherr et al., 2017). Kristoffersen et al. (2021) suggested that managers need to strategically manage industrial life cycles, focusing on innovation, reduction, and resource recirculation. Li & Yu (2018), among others, argued that eco-friendly behaviors within organizations can positively affect sustainability across economic, environmental, and social dimensions.

Materials and methods

In our research, we utilize a bibliometric analysis method. This involves extracting relevant articles from the Web of Science (WoS) database and then importing them into VOSviewer, a tool tailored for bibliometric evaluation and keyword depiction. Bibliometric charts act as a quantitative instrument, enabling the visualization of bibliometric characteristics across various scientific papers through different network structures. This graphical representation offers insights into the structure and evolution of multiple research fields (Suryantini et al., 2021). For this investigation, we source data from the WoS core collection, centering our research on the phrases "circular economy" and "digitalization". We employ the VOSviewer software, a freely available tool introduced in 2009 by Van Eck & Waltman (2010) at Leiden University's Centre for Science and Technology Studies (CSTS) in the Netherlands, to perform a keyword co-occurrence assessment of the selected literature. This approach, focusing on keyword overlap, has been applied in diverse areas from healthcare (Yeung et al., 2021) to elderly community engagement and crisis response (Fu et al., 2020). Keywords act as prisms, honing in on central themes and topics within a field's body of literature. They can highlight dominant research areas and unfolding patterns (Huang et al., 2020). As such, we use VOSviewer in our research to conduct a keyword co-occurrence evaluation, aiming to explore the relationship between the circular economy and digitalization.

The methodology applied in this research is laid out systematically, as delineated in Table 1.

Table 1.
The structure of the research methodology.

Stages of research	Content
Data sorting from WoS using search subject “circular economy” and “digitalization”	Categorising 1855 relevant scientific articles from 2015 to the first quarter of 2023 including key words, author, year, researchmethods, content.
Analysing the publication ofcircular economy and digitalization sphere	To examine the trends in published articles focused on the circular economy and digitalization over different years, a bar chart analysis was conducted.
VOSviewer analysis on“circular economy” and“digitalization”	VOSviewer was employed to conduct a comprehensive analysis of keyword co-occurrence using articles sourced from the Web of Science (WoS). This analysis aimed to reveal the status and future directions within the field. The first aspect of the analysis involved keyword analysis, where the frequency and relationships of keywords were examined. Additionally, overlay visualization analysis was performed to identify the connections and overlaps between different sets of keywords.
Multidisciplinary research	To further analyse the status and future directions of the subject areas related to the research, a classification and selection process was conducted using keyword co-occurrence analysis in VOSviewer.

The research approach is articulated through four clear stages:

1. Identifying the core research focus and gathering articles related to the circular economy and digitalization. This involves organizing and systematically compiling all relevant information.
2. Utilizing bar graphs and pie charts to document and showcase the sources of publications that touch on the circular economy and digitalization, providing a comprehensive perspective on the origins of these works.
3. Undertaking keyword co-occurrence analysis using VOSviewer. This involves crafting visual mappings of keyword links, highlighting the most prevalent keywords, creating visualization overlays, and identifying emerging research terms.
4. Pursuing interdisciplinary explorations by investigating various thematic areas within the WoS database. This entails selecting specific thematic sectors and executing keyword co-occurrence analyses specific to each selected area.

These stages form the foundational structure of our research approach, equipping us with the means to deeply analyze and grasp the nexus between the circular economy and digitalization.

Results and discussions

The information used in this research was derived from the Web of Science (WoS) core collection. By centering the search on “circular economy” and “digitalization”, we obtained a total of 1855 articles spanning from 2015 to the first quarter of 2023. Figure 1 visually represents the upward trend in the quantity of articles centered on "circular economy" and "digitalization" over the years. Starting with a humble 12 articles in 2015, the count rose dramatically to 600 by 2022. This rising trend indicates a consistent and growing academic curiosity in this area, signaling its potential significance in upcoming academic pursuits.

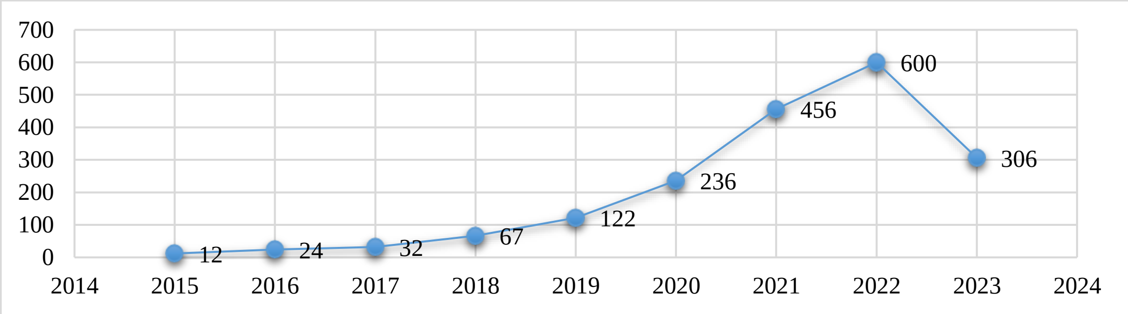

Figure 1. Numbers of scientific papers on "circular economy" and "digitalization" published from 2015 to the first quarter of 2023 as documented in the Web of Science.

The initial step involved importing all the articles into the VOSviewer software to generate a term map for the keyword co-occurrence analysis. This evaluation covered 431 keywords, with each appearing at least three times. Out of these, 59 keywords met the set threshold and were chosen for a detailed study, visualized using both network and overlay representations.

Within the network view, the visualization included textual labels, circles, connections, and various colour segments. Based on the software's standard settings, individual items were represented by labels and circles. The size of the label and circle indicated the significance or weight of the item. The closeness or strength of the connections between items indicated their shared significance or relation (Li et al., 2016). Separate clusters were marked by unique colour hues.

As illustrated in Figure 2, the VOSviewer produced six separate colour regions, each signifying a unique cluster. Cluster 1 was predominantly linked with business-oriented terms such as economic growth, digitalization, servitization, co-created value, and consumers. Cluster 2 delved into tech-centric terms like digital tech, IoT, and blockchain. Cluster 3 covered themes like industrial symbiosis, the sharing economy, innovation, and structure. Cluster 4 revolved around sustainability concepts, featuring terms like strategic planning, supply chain oversight, and modelling. Cluster 5 touched on managerial elements in economic and tech realms. Finally, Cluster 6 focused on life cycle oversight, tackling subjects like design approaches, recycling methods, and waste handling.

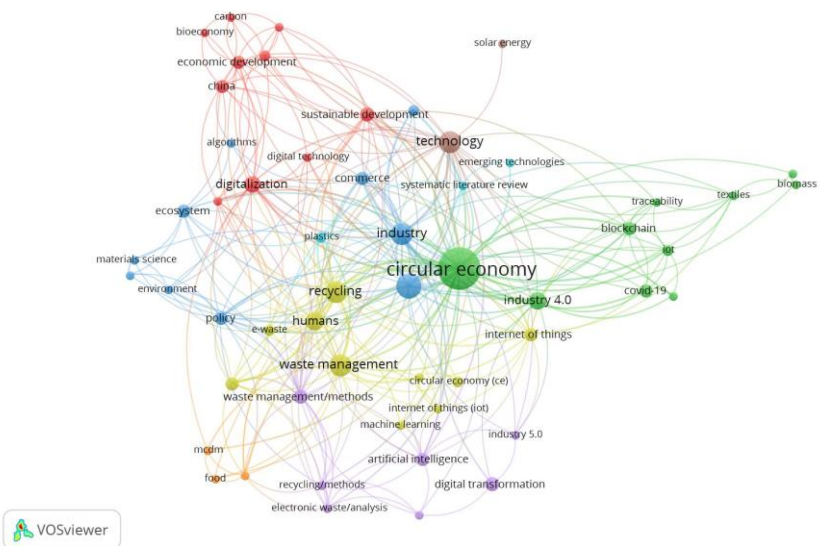

Figure 2. Keyword network visualization of “circular economy” and “digitalization” from year 2015 to the first quarter of 2023 via VOSviewer.

Within the identified clusters, chief keywords central to discussions about the circular economy and digitalization include terms like circular economy, digitalization, industry, waste management, artificial intelligence, and technology. These keywords encapsulate the primary themes emerging from the keyword co-occurrence assessment using VOSviewer.

Table 2 provides a breakdown of the most frequently referenced keywords from the analysis. These terms make at least ten appearances and come with attributes such as their colour designation, related cluster, frequency of mention, and overall link strength. This table serves as a snapshot of the core terms intertwined in the cross-disciplinary exploration of the circular economy and digitalization, emphasizing their significance and consistent reference in scholarly literature.

By deploying the overlay visualization technique, we can extract pivotal insights about the primary research themes over different periods, paving the way for understanding potential future research directions. Figure 3 presents a visual depiction of keywords from all the literature examined in this study, covering from 2015 to the early part of 2023. The array of colours in the graphic denotes the chronological order, initiating with shades of purple and transitioning through hues of blue and green, ultimately reaching yellow. This colour transition reflects the journey from the initial stages of research to the most up-to-date findings.

Table 2.
High-frequency keywords "circular economy" and "digitalization" from year 2015 to the first quarter of 2023 via network visualisation of VOSviewer.

Colour	Cluster	Keyword	Occurrence	Total Link Strength
	1	Digitalisation	6	26
	2	Circular economy	41	110
	3	Industry	11	54
	4	Waste management	11	49
	5	Artificial intelligence	5	31
	6	Technology	11	44

By examining the overlay visualization, researchers can gain a comprehensive understanding of the temporal distribution and development of research topics within the field of interest. This visualization aids in identifying emerging trends, shifting focuses, and potential areas for further exploration in future research endeavours.

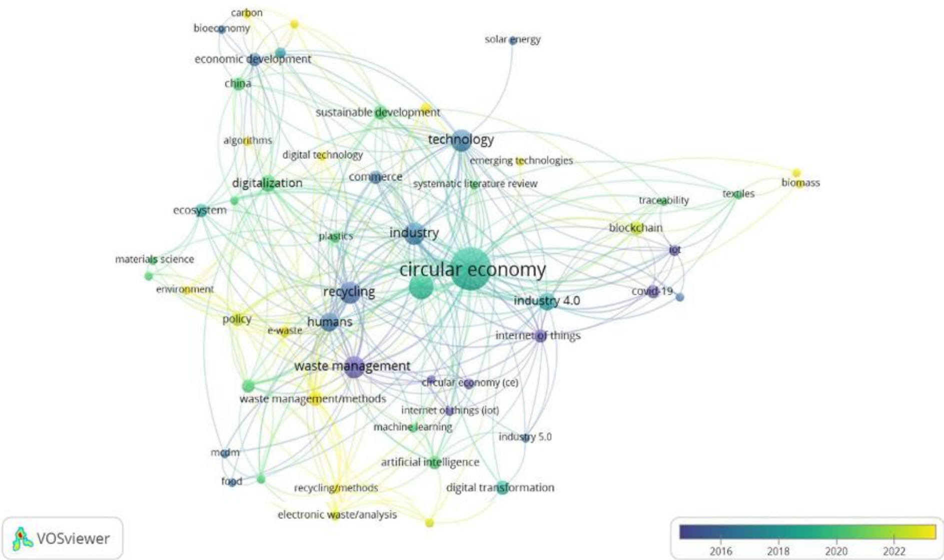

Figure 3. High-frequency keywords "circular economy" and "digitalization" from year 2015 to the first quarter of 2023 via network visualization of VOSviewer.

The following are the summarized hot research keywords within the field of circular economy from the years 2015 to the first quarter of 2023:

1. Business-related keywords: This scheme encompasses keywords such as business models, servitization, value co-creation, and consumer behaviour. These keywords highlight the growing interest in developing innovative business models that promote circular economy principles, emphasize value creation, and involve active participation from consumers.
2. Keywords cantered on technology: This category encompasses terms such as digital technologies, internet of things (IoT), and smart producing. These keywords indicate the significance of technological advancements in driving circular economy initiatives, particularly in areas such as digitalization, automation, and efficient resource management.
3. Sustainability-related keywords: Keywords within this scheme revolve around sustainability strategies, supply chain management, and sustainable business practices. These keywords underscore the importance of incorporating sustainable practices into circular economy frameworks, ensuring responsible resource management and minimizing environmental impact.
4. Circular waste management keywords: This scheme comprises keywords like waste management, recycling, and waste-to-energy. It highlights the growing emphasis on effective waste management practices, including recycling and the conversion of waste materials into valuable resources, as crucial components of circular economy strategies.
5. Emerging technology keywords: This scheme includes keywords such as AI and blockchain, indicating the rising interest in leveraging advanced technologies to enhance circular economy practices. AI and blockchain have the potential to optimize resource utilization, trace product lifecycles, and enable transparent and efficient supply chains.

In the current research hotspots of the first quarter of 2023, the keywords “big data” and “supply chain management” have emerged with higher frequency, suggesting their prominent presence and potential strong connections within the research field. This indicates that these topics have attracted significant attention and have been extensively studied. Additionally, keywords such as “barriers”, “impact”, and “performance” are also frequently mentioned, further emphasizing their relevance and significance within the current research landscape.

On the other hand, certain keywords like “artificial intelligence”, “demolition waste”, “consumer behaviour”, “life cycle assessment”, “climate change”, and “BIM” appear less frequently, suggesting that they may have untapped research potential. These topics hold promise for future research endeavours as they offer opportunities for new insights and advancements in the field of circular economy and digitalization.

The topic of circular economy and digitalization is characterized by its multidisciplinary nature, encompassing various subject areas. The main fields that contribute to this topic are digital technology and environmental science.

The integration of these disciplines is crucial for advancing circular economy practices and achieving sustainable implementation strategies. By integrating knowledge from both digital technology and environmental studies, scholars can craft pioneering business strategies, devise impactful policies, and accelerate the shift towards a circular economy.

It enables the exploration of synergies between technological advancements and environmental considerations, fostering a holistic approach towards sustainable development. By bringing together expertise from different disciplines, researchers can develop comprehensive solutions that promote circularity, resource efficiency, and choosing effective business model and economic system.

Conclusions

The aim of this study is to revolves around probing the contemporary research milestones and trajectories in the nexus of the circular economy and digitalization. As a part of our approach, relevant articles were retrieved from the core compilation of the WoS database and subsequently underwent VOSviewer analysis for keyword visualization. This assessment aimed to discern the intertwined relationship between the circular economy and digitalization. From this inquiry, three salient revelations emerged:

1. The leveraging of the VOSviewer bibliometric method enabled a comprehensive keyword co-occurrence investigation, shedding light on co-occurrence clusters, primary research

themes, and keyword evolution trends linked to "circular economy" and "digitalization."
2. An encompassing scrutiny of articles across diverse academic fields and publications highlighted the interdisciplinary nature of this research topic.
3. The identification of existing research gaps and burgeoning trends, offering a roadmap for future scholarly pursuits, stands to benefit a wide audience, ranging from the general populace and policy shapers to academic researchers.

Moreover, the intertwined network of terms closely associated with the circular economy and digitalization includes keywords such as sustainability, Industry 4.0, design, management, and framework. These terms illuminate potential avenues for future research. Key research terms identified through overlay visualization from 2015 to the first quarter of 2023 can be distilled into five main themes: collaborative methodologies, economic paradigms, emerging information technology, strategic blueprints, and advanced data analytics. These themes provide a roadmap for upcoming scholarly pursuits.

A limitation of this study is its singular focus on the WoS database. There's a likelihood that other significant publications may be indexed in other databases like Scopus or Google Scholar. To achieve a more encompassing view, subsequent investigations should consider sourcing from multiple databases and juxtaposing the outcomes with the present study. However, amalgamating, and visualizing data from diverse databases using VOSviewer could pose challenges, warranting careful consideration in future research efforts.

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Korotko's phenomenological myth of Odesa in *Bera and Cucumber*: otherness, melancholy and anthropocene

Феноменологічний міф Одеси у книжці "Бера і Огірок" О. Коротка: інакшість, меланхолія та антропоцен

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Abstract

In the research, with the help of the method of mytho-criticism and archetypal analysis (Carl Gustav Jung), the author has analyzed and outlined the chronotope represented in the stories in Bera and Cucumber by Aleksandr Korotko. This book, translated into English by M. Pursglove, was published in London in 2023. With the help of archetypal analysis, the Odesa text was characterized as a mythological one. It has been investigated that the Odesa narrative represents a special worldview of the heroes, who are characterized by a combination of kabbalistic worldview, Christian humanism, Turkish melancholy, contemplativeness that results from the unity of the heroes of the Odesa space with eternal nature elements. The writer reconstructs the Odesa identity in its ontological form: the social interaction between the characters reveals their essence superficially, on the other hand, the anthropocene way of depicting the characters as immanently connected with the elements of nature reveals their universal ontological essence. The Odesa text is represented as mythological one, the loci of which are subordinated to the idea of the immutability of space and time. This is the peculiarity of the chronotope marked by mythological intentions: the characters appear only as variable, fluid entities in the macrocosm of Odesa that as depicted in Korotko's stories is characterized by the intertwined relationships

Анотація

У статті за допомогою методу міфокритики й архетипного аналізу (К.-Г. Юнг) проаналізовано й окреслено хронотоп, репрезентований в оповіданнях у книжці "Бера і Огірок" Олександра Коротка. Цю книжку в англійському перекладі М. Пурсглава (M. Pursglove) було видано в Лондоні в 2023 р. (Glagoslav Publications). За допомогою архетипного аналізу одеський текст схарактеризовано як текст міфологічний. Досліджено, що одеський простір репрезентує особливу світоглядну настанову персонажів, яким властиве поєднання кабалістичного світогляду, християнського гуманізму, турецької меланхолії, контепляційності, що випливає з єдності героїв одеського простору з правічними стихіями. Письменник реконструює одеську ідентичність в її онтологічній формі: соціальна інтеракція між персонажами розкриває їхню сутність поверхово, натомість антропоценний спосіб зображення персонажів як іманентно поєднаних зі стихіями природи розкриває їх універсальне онтологічне єство. Одеський текст репрезентовано як міфологічний, локуси якого підпорядковано ідеї незмінності часопростору. В цьому полягає особливість хронотопу, маркованого міфологічними інтенціями: персонажі постають лише змінними, плинними сутностями в макрокосмі Одеси, де споконвіку дух реалізує себе як через

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between the spirit, nature, and humanity from ancient times. Rather than viewing human beings and nature within a subject-object framework, the writer presents a holistic system that reflects an anthropocene perspective of the world. The article argues that traditional logocentric paradigms fall short in capturing and unraveling the identity of Odesa that is intricately woven into the interconnected narratives of Korotko's stories.

Keywords: Odesa text, Odesa myth, mytho-criticism, archetype, melancholy.

феномени природи, так і через людину. Письменник послуговується зображенням людини і природи не в суб'єктно-об'єктній парадигмі, а в системі голістичного зв'язку, який розкриває антропоценний погляд на світ. У статті наголошено, що в логоцентричній парадигмі неможливо описати й розкрити одеську ідентичність, яку репрезентовано в оповіданнях О. Коротка.

Ключові слова: одеський текст, одеський міф, міфокритика, архетип, меланхолія.

Introduction

Aleksandr Korotko’s (Олександр Коротко) short stories collection *Bera and Cucumber* (in Ukrainian: “Бера і Огірок”) has reinforced in the discourse of contemporary post-postmodern literature the discussion about a new representation of the well-known and already established concept ‘Odesa text’. The events in the short stories take place in Odesa and are directly related to the Odesa mythological representation and its special identity, the psychology of Odesa residents, the specific worldview of the characters who live near the sea and have a special type of relationship with nature.

The thesis statement of this article is that in Korotko’s *Bera and Cucumber*, Odesa is portrayed as a mythical city that encapsulates the complex history and cultural identity determined by the sea. The narratives woven around Odesa in these short stories delve into the multifaceted layers of the city's past and the intertwining of diverse cultural influences, mainly Jewish. Through the lens of postcolonial discourse, A. Korotko has skillfully crafted his short stories that capture the essence of Odesa as a space that evokes melancholia, nostalgia, defiance, and a rich tapestry of interconnected narratives.

Moreover, the fictional portrayal of Odesa’s mythological narrative in Korotko’s contemporary postcolonial fiction serves as a compelling example of how the author has engaged with the complexities of history and identity. By delving into the mythos of Odesa, these narratives offer a profound exploration of the city's significance in the postcolonial context, shedding light on its enduring impact on the imagination and consciousness of its inhabitants and those who encounter its literary representations. Odesa in *Bera and Cucumber* becomes more than just a physical setting; it becomes a symbol of resilience and cultural-metaphysical hybridity.

In this article, the author has focused on reevaluating the 'Odesa text' and ‘Odesa myth’ in contemporary fiction, aiming to provide a fresh perspective on this cultural phenomenon. The new representation of the 'Odesa text' in Korotko’s *Bera and Cucumber* involves examining how Odesa, as a city and a concept with specific mythological explications, is portrayed in various literary works and cultural contexts. This analysis is important because the 'Odesa text' not only represents a specific geographical location but also embodies a unique cultural identity shaped by historical events and the concept of melancholy, multicultural population, and influential literary figures. By delving into this representation, it is possible to gain a deeper understanding of the complexities and significance of the Odesa narrative in literature and its broader cultural implications, e.g. in the anthropocene paradigm.

The ongoing Russian invasion in Odesa has drastically altered the region's landscape and world perception, disrupting the centuries-old colonial paradigm that had shaped the city's identity. The attacks on Odesa have brought to the forefront the realities of conflict and the struggles faced by its inhabitants, challenging the romanticized notions often associated with the city represented in Russian fiction of the previous times. This shift has forced a reevaluation of Odesa's historical context and cultural significance in the post-colonial Ukrainian paradigm, highlighting the resilience of its people. The current situation underscores the need for a nuanced understanding of Odesa's past and present, shedding light on its complexities beyond the colonial framework. *Bera and Cucumber* offers a unique perspective on contemporary Ukrainian fiction in the context of wartime, contributing to the growing body of fiction about the country that is emerging on the world book market. One notable example is Maria Miniailo's book *24.02* that explores the theme of resistance in contemporary Ukraine. In this narrative, the discourse of resistance is depicted through elements of satire and anti-colonial motives, as in Miniailo's novella *Stolen Spring* (Drozdovskyi, 2023). The increasing visibility of such narratives not only sheds light on the socio-political landscape of Ukraine but also serves as a testament to the resilience and creativity of Ukrainian writers in portraying the complexities of their homeland's experiences during times of conflict.

Korotko's *Bera and Cucumber* offers a unique narrative portraying Odesa as an anthropocene reality, a place of peace, melancholy, and harmonious coexistence, emphasizing the inherent qualities of its citizens. The sea serves as a significant backdrop shaping the worldview of characters navigating a cross-cultural environment, blending elements of Jewish and Ukrainian identities. Through this lens, the characters strive to mitigate the absurdities of life. Korotko's *Bera and Cucumber* sheds light on the intricacies of coexisting in a multiethnic setting, highlighting the city's vibrant tapestry of cultures and the shared pursuit of melancholy, peace and understanding among its inhabitants who live in the anthropocene reality.

Studying the representation of Odesa as a mythical phenomenon in *Bera and Cucumber* is vital for several reasons. First, examining how Odesa is portrayed in contemporary fiction allows for a deeper understanding of its cultural significance and the impact of historical and political events on its identity in the post-colonial paradigm. Second, analyzing the mythic essence of Odesa in *Bera and Cucumber* can provide insights into how myth shapes collective memory and influences perceptions of place and community. By delving into the mythical representation of Odesa in *Bera and Cucumber*, the author of this paper has uncovered hidden layers of Odesa myth and melancholy, explore the intersection of reality and imagination, and ultimately contribute to a more nuanced appreciation of the city's rich cultural heritage as a pce of melancholy and leisure.

In this context, the representation of Odesa as a special mythological city with an eternal identity based on elements and harmony reflects a new understanding of Odesa as an ontological place. The characters in *Bera and Cucumber* are likened to mannequins, suggesting a deeper symbolic connection to the overarching themes of existence and parabolic realism (Drozdovskyi, 2021) and surrealism that permeate the narrative. This analysis sheds light on how the city of Odessa is portrayed as a timeless entity embodying universal principles, offering a unique perspective on its cultural and metaphysical significance in the novel.

In the literature review section of the article, readers can expect an overview of existing research on Odesa's myth and ontological identity, contextualizing the significance of these themes in Korotko's *Bera and Cucumber*. The methodology section will detail the approach taken to analyze the representation of Odesa in *Bera and Cucumber*, outlining the research methods and theoretical framework employed. The results and discussion section will present the findings of the study, exploring how Odesa is mythologized in *Bera and Cucumber* and how its ontological identity is constructed in Korotko's narrative. Finally, the conclusions section will synthesize key insights, offer interpretations of the findings, and suggest implications for further research in this cultural and literary area.

Theoretical framework or literature review

The hypothesis of the research is that the Odesa narrative unfolds the landscape of the short stories in three vectors: 1) *anthropocene* that implies a special connection of the characters with the sea and nature in general, their immersion in the natural world, deep unity, manifested with the help of the sea and other natural phenomena and elements. The concept of *anthropocene* has been discussed in recent academic researches and it provides a new outlook on how we can exploit literary phenomena taking into account a special point of view based on the deconstruction of traditional antagonism between subject and object. The nature in such phenomena is not considered to be an object but has its role epistemological status. We see a peaceful co-existence between human beings and nature and the humans follow the principles of nature organization in order to survive and to avoid catastrophes that may happen due to the human destructive activities. Korotko's short stories demonstrate these deep anthropocene connections between human beings and the sea, human psychology and nature cycles, which is portrayed in the analyzed texts. The methodological approach and theoretical framework regarding this section of my research is based on the publications by C. Bonneuil and J.-B. Fressoz (2016), N. Castree (2015),

P. J. Crutzen and E. F. Stoermer (2000), V. Napolitano (2017), S. Solnick (the author of the chapter “Anthropocene” in *The Routledge Companion to Twenty-First Century Literary Fiction*, 2018), S. Dalby (2015), R. Macfarlane (2016), W. McKenzie (2015), A. Trexler (2015), S. Mentz (2015), C. Waters et al., (2014). In Korotko’s writings, we observe the fundamental idea of anthropocene reality in which nature has an important impact on human mentality and it structures human lives and leisure activities, determining human behaviour and a special way of world perception. 2) a special type of *leisure* that is included in the life of the characters, the opportunity to contemplate most of the time, rather than act; a special way of life that involves immersing oneself in oneself and feeling all the movements of nature that helps to maintain psychological balance, and it is worth emphasizing that this form of leisure is typologically combined with a special concept of life that is present in the Turkish worldview discourse, and that also correlates with the Jewish tradition worldview that verbally visualizes the multidimensionality of the Odesa text in *Bera and Cucumber*; 3) the *Otherness* of the Odesa world (Odesa identity): the language of the characters appears to be radically different, which is especially noticeable in the English translation by Michael Pursglaove, the O*therness* of worldviews, life orientations, etc.

These specified vectors determine the peculiarity of the representation of the Odesa text in Korotko's book. The writer resorts to the representation of the Odesa myth that is heterogeneous, multidimensional, and multicultural. Moreover, it is worth saying that for centuries, Odesa has been integrated into the cultural map and mindset of the Russian Empire. A. Korotko with his short stories have deconstructed this tradition paying attention to the immanent uniqueness and *Otherness* of Odesites and Odesa narrative not in the empire cultural paradigm but taking into account the specific features of Odesa mind, psychology, identity, leisure, connections with nature and anthropocene in general.

Besides, there is no political factor in the Odesa narrative that is psychologically reliable and artistically depicted by the writer. The characters are immersed in the space of everyday problems that reveal their philosophy of humorous stoicism, the ability to perceive difficult situations with dignity, with a smile, revealing a special inner strength that comes from immanent wisdom. Here it is appropriate to say both about the motives of Ecclesiastes and about the special kabbalistic conception of the world (Scholem, 1996) that is a characteristic of Odesites.

Methodology

In conducting a rigorous study on the representation of Odesa as a myth-narrative in Korotko's *Bera and Cucumber*, several key methodological considerations are essential to ensure the validity and reliability of the research findings. First, the selection of the text for analysis was justified based on its relevance to the study's research questions and objectives, with clear criteria outlined for why *Bera and Cucumber* was chosen as the primary source material. This importance is determined by the contemporary political situation and the importance of representation of Odesa to the world community. Korotko’s book *Bera and Cucumber* published in London in 2023 (translated by Michael Pursglove) provides a ground for such a discussion about the representation of Odesa in the post-colonial paradigm in Ukraine’s wartime context. The data collection was comprehensive, involving a thorough examination of the text to identify and document all instances where Odesa is portrayed in a mythological context in *Bera and Cucumber*. The analysis employs a theoretically informed approach, drawing on established literary and mythological frameworks to interpret Odesa's narrative function in *Bera and Cucumber*. Rigorous data analysis techniques, such as close reading, content analysis, thematic analysis, archetype analysis, and comparative analysis has ensured a robust exploration of Odesa's mythic representation. Furthermore, the study critically engages with the existing literature on mythology, narrative theory, and post-postmodern literature of the 21st century to situate the analysis within a broader context.

The criteria for selecting stories from *Bera and Cucumber* about the identity and ontology of Odesa as a mythological narrative included elements such as the centrality of Odesa as a character and a place (*locus* and *topos* at the same time), the exploration of themes related to identity ontology within the narrative, and the symbolic significance of Odesa in conveying mythological concepts. Additionally, stories that delve deeply into Odesa's origins, characteristics, and role within the narrative as it relates to broader mythological themes have also been considered in the selection process. Overall, the chosen stories from *Bera and Cucumber* offer a rich and nuanced exploration of Odesa's identity as an ontological phenomenon within the mythological framework.

In the context of studying Odesa as a myth and as a text in Korotko's *Bera and Cucumber*, the data analysis has involved categorizing textual passages related to Odesa, identifying recurring themes or motifs, analyzing narrative structures and character development, and exploring intertextual references or symbolic representations associated with Odesa. It was essential to outline the specific analytical tools, frameworks, and methodologies (works of A. Stepanova, S. Kaya, M. Gauhman) used to examine Odesa's mythological and textual dimensions in order to elucidate the research process and outcomes for readers and researchers alike.

In analyzing Odesa as a myth and as a text in Korotko's *Bera and Cucumber*, a detailed methodology has included several steps. First, a thorough reading of *Bera and Cucumber* was conducted to identify passages where Odesa is mentioned or plays a significant role. These passages are then categorized based on themes such as identity, ontology, symbolism, and cultural references related to Odesa. Second, a hermeneutic process is implemented to tag specific textual elements associated with Odesa, such as character descriptions, interactions with other characters, and narrative progression. A thematic analysis was carried out to explore the mythological underpinnings of Odesa's character, including any symbolic or archetypal representations present in *Bera and Cucumber,*. Third, a comparative analysis was conducted to examine how Odesa's portrayal aligns with traditional mythological narratives or deviates from conventional mythic structures. The data analysis involved further interpreting the findings in the context of broader literary and mythological theories, aiming to uncover insights into Odesa's significance as both a myth and a literary character in *Bera and Cucumber.* Finally, the detailed data analysis approach ensures a comprehensive exploration of Odesa's multifaceted dimensions within *Bera and Cucumber,* enriching the understanding of Odesa as a mythological figure and textual construct in Korotko's book.

Methodology of myth (archetype) studies, cultural studies and hermeneutic approach have been exploited in this research. The author has provided the structural and phenomenological analysis of Korotko's short stories to underline the key concepts that spotlight and structure a phenomenological representation of Odesa text and Odesa's mythological narrative as it is portrayed in *Bera and Cucumber*.

The concepts of *Odesa text* and *Odesa myth* have been discussed and explained in contemporary publications in the aspect of postcolonial interpretation of Odesa cultural and literary texts (M. Gauhman, 2016; Ja. P. Ginrihs, 2011; T. Shekhovtsova & S. Yurchenko, 2020; A. Stepanova, 2022). "The Odesa text represents a certain figurative structure, <....>, the urban consciousness accumulates its highest spiritual meaning through the perception of the city.

The semantic setting (idea) of the Odesa text initially lay in the sociocultural plane and was associated with the historical image of the city and its perception in the minds of citizens. Founded in 1795, Odesa according to the plan of Catherine II was destined to become an ordinary trading city-port" (Stepanova, 2022, p. 734).

Furthermore, in the article, the author has provided a postcolonial interpretation of Odesa narrative in Korotko's *Bera and Cucumber* as a phenomenological being that has its unique nature. This nature of Odesa is not connected with political ideology and social structures but it is determined by the inner psychology of Odesites who live in peaceful coexistence with natural elements, such as the Black Sea, etc. The phenomenological nature of such phenomena structures the mindset of Odesites and reveals its multifaceted mythological revelation of Odesa as a mythological narrative

Results and discussion

The selection of stories that in *Bera and Cucumber* portray Odesa in a post-colonial frame and emphasize its ontological identity as an eternal place reflects a deliberate methodological approach to highlight the essence of Odesa as a myth. This rigorous research methodology aims to delve deeper into the philosophical and existential nature of Odesa, exploring its timeless and intrinsic characteristics that define the city in Korotko's *Bera and Cucumber* as more than just a physical location (locus and topos) but as a place with enduring significance and symbolism. By analyzing Odessa's ontological essence through these narratives, this research offers a comprehensive examination of the city's cultural and historical post-colonial underpinnings, enriching the understanding of its complex identity beyond mere geographical boundaries and ideological limitations, politics and social boundaries.

Moreover, the criteria for selecting stories from *Bera and Cucumber* were connected with the concepts of multicultural and multidimensional representation of Odesa in historical terms, while aiming to create a unifying narrative of harmony and peace that portrays a thematic focus on the desire for tranquility, contemplation, and unity. These stories exemplify a shift towards introspection over aggression, emphasizing the role of human nature in creating rather than destroying. The chosen stories also reflect the sea in the narrative as a symbolic space of elemental forces that provide leisure, inspiration, freedom, independence, and autonomy, underscoring a connection to nature and inner self-discovery. By selecting stories that embody these criteria, the compilation in *Bera and Cucumber* presents a diverse and historically rich portrayal of Odesa's character that aligns with the overarching theme of seeking harmony and peace through contemplative and harmonious narratives. Besides, the criteria for selecting the stories was based on the premise that humans in the narrative are represented not superior to nature but instead dependent on it, as evidenced by the sea's influence on their attitudes towards leisure. It was stressed that the narratives highlight a unique perspective on leisure that reflects a form of freedom. In *Bera and Cucumber*, this concept is embodied through internal freedom and a deep connection to elemental forces that transcend societal constraints and conventional perceptions of time. According to the analysis, the characters despite being engaged in social responsibilities maintain a profound affinity with nature's timeless essence, portraying a sense of kinship and liberation through their interactions with the elements.

Moreover, to underline the rigor of the study, it is important to say that Korotko's Odesa text represents a system of values based on the concepts of honour, dignity and truthfulness. It is these concepts that correlate with the categories defining the life world of the characters. Special attention is paid to the depiction of landscapes, the landscape plan that correlates with the element of the sea. Life near the sea, as the narrator convinces, forms a special philosophy in Odesites as a way of relating to events and things. They are able to dissolve in the natural element, to immerse themselves in the primal matter that cannot be destroyed by the ideological and political contradictions of the time. To depict the political world, the writer uses humour and ironic mode. Instead, the style of describing landscapes, sea, Odesa air, streets and historical districts (Moldavanka, city down town) and quarters has a special slowness. In such places, the narrative seems to dissolve in the element about which the narrator speaks.

He was born, and grew up, on Mala Arnautska Street, and his whole life had passed in full view of an old Odesa *dvoryk* or yard. Solomon Volkovich was the image of a wise man twenty-four hours a day, so it was impossible to catch him out. His neighbours thought he had gone in the head, admittedly not very far. But no one doubted he was heading that way (Korotko, 2023, p. 16).

Emphasis on the connections of Odesa characters with nature, in particular the sea, contributes to the general mythologizing of the narrative. Stories reveal to the reader a strange world that has its own *autonomy*. Certain worldview parameters of the characters in the stories convince readers that Odesites have an inherent wisdom that is usually associated with the Eastern tradition (wisdom as a system of constant parameters of world perception that determines the stability of the world, its harmony, and the harmonious existence of a person in this world for the sake of happiness and other benefits).

Indeed, Korotko's short stories are dominated by philosophical contemplation, contemplativeness that correlates at the same time with the absurd and whimsical world of social processes in which the characters *volens nolens* exist:

The quarters to which the tourists flock and where real Odesites live are two separate towns, with feuds and nomadic raids by their core inhabitants. The first is idle and imperious, well fed, unhurried in thought and deed, the second is human and embittered, life-enhancing and gloomy, cut off from flourishing hopes by disorganisation, daily existence, screaming children and overworked streets, sickness and malaise; it yearns to earn money on the eve of running out of it. Oh, these eves – reliable and true friends of Odesites! (Korotko, 2023, p. 88-89).

Odesa in *Bera and Cucumber* is multicultural, multidimensional in historical terms, and the unifying narrative that combines different historical dimensions is the desire to create a space of harmony and peace, when contemplation wins over activity, so that human nature does not reveal itself in something aggressive to the unworthy, which destroys rather than creates.

The world of the sea is a space of elements that gives leisure, inspiration, freedom, independence, and ultimately autonomy.

Half a year went past. He was standing on the penthouse terrace wearing an expensive suit and a snow-white shirt, looking at the sea. It seemed to him that no one in the world felt the sea like he did. As he looked at the raging element, Solomon Volkovich suddenly realised what was happening in his soul. Maybe the sea was his soul and he himself was nothing, dust, a hollow being, an empty one-room flat lacking furniture, comfort and warmth. But the sea seethed, changing its colours and shades, summoning help. How could he save both his soul and himself? Again, he wanted to look beyond the horizon and sea, beyond the fiery red curtain of the sunset scenes of spiritual life, but his imagination failed him. From the height of the spiritual fog all that could be heard was the croaking of frogs in the subterranean underpasses of satiated normality (Korotko, 2023, p. 28-29).

A human being in these stories is not superior to nature, he or she is dependent on it, because the sea itself determines the special attitude to leisure, which is represented in various narratives. Leisure is a special form of freedom in the book. If we recall the ancient world, slaves did not have the right to leisure time: only free citizens had leisure time. This maxim finds its embodiment in *Bera...:* we have images of internally free people who, although forced to deal with various social concerns, nevertheless deeply feel a kinship with the elements that are not governed by time.

In Korotko's book, the characters refuse the subject-object existence in the human-nature system. They exist in an inseparable unity of material and metaphysical, corporeal and transcendental, physical and elemental, material and spiritual. Odesa world has its own language, its own philosophy of life. By this concept, we understand the ethical code of norms, which are formed not in the socio-political plane, but in the philosophical, metaphysical plane, which combines various religious experiences and traditions, sometimes different in time and space, but approximate in its ontological basis.

"Mama: De Baguza de bazé?
Son: Bazé.
Mom: Be manóta chi?
Son: Útsa.
Mama: Néisyk dúkhil fo?
Son: Limatýka na koté?
Mama: Bókhil!
Son: Móza zui
Peaceful conversation smoothly switches to elevated tones.
Mama: Zóga!
Son: Gam!!" (Korotko, 2023, p. 88).

"One of such concepts corresponds to the Turkish concept *hüzün* (melancholy). Melancholy, or *hüzün in Turkish.* is a key concept for understanding the worldview of a Turkish person" (Drozdovskyi, 2013). According to one interpretation, it is what is experienced when we "put too much effort and time into achieving earthly pleasures and material goods" (Pamuk, 2012, p. 124). For Sufis, *hüzün is* "the mental torment of not being able to be closer to Allah, because in this world we are unable to do as much as is necessary for him" (Pamuk, 2012, p. 125). Finally, according to El Kindi, "*hüzün* is not only the pain of the loss or death of a loved one, but also other emotional disturbances such as rage, love, malice and unfounded fear" (Pamuk, 2012, p. 126). Istanbul is also hüzün, and therefore everything in this city is perishable, like a phantom. Istanbul itself is important as a space of memory, which must be preserved in an image: verbal or pictorial. Istanbul does not exist without its inhabitants, whose language it speaks every minute. And therefore, not having support from his parents to become an artist, Orhan chooses another "profession": to be a writer. He must preserve the memory of his eternal city" (Drozdovsky, 2013). The researchers draw attention to the fact that both in the novels of the Turkish writer and in the Ukrainian literature of the latest period, a feeling of melancholy is presented that is a component of the structure of the worldview of the characters. "In the novels "Silent House", "Snow" by O. Pamuk and "Living Sound" by A. Kokotiukha, a type of city person is proposed who acutely feels his alienation and loneliness among a large crowd, in the community of fellow citizens and in his own family. If the options for the initiation of the urban hero are specific to novels with a historical or pseudo-historical background, then the self-estranged one is found in works where the city is the embodiment of the modern world. The characters have big dreams and hopes, which are shattered by the realization of the impossibility of changing social relations. So the melancholic intonations, the dramatic finale, as well as the existential loneliness of the city man, are foreseen" (Kaya, 2021, p. 234). A similar motif is represented in *Bera and Cucumber*, where Odesites are characterized by *melancholy*, which stems not only from existential *loneliness*, but from the ontological *autonomy* of each character, which revitalizes the connection with an ancient myth and is a representation of the archetypal image of the protohuman.

"Memories make us even more lonely. We become like trees in winter. I look at their bare flesh, shyly avert my gaze, and don't know where to put myself or what to do with this cloud called soul.

My memory stands behind your back, you are frying sunflower seeds in a hot frying pan, carefully sprinkling them with salt with a table spoon, and stirring them unhurriedly. I come a bit nearer, you feel my breath, and, as if nothing has happened: "Son, I'll just finish frying them, they can cool down a bit and we'll go to the football. There's still time" (Korotko, 2023, p. 97).

Turkish *melancholy* in Korotko's book is typologically similar to the feeling of spleen, contemplation, dissolved in being. Such a feeling arises from the fact that a person is immersed in the world of nature, and not superficial social processes. Its existence is determined by the eternal elements that reveal an unlimited space of freedom to human beings. In this case, a person tries to imitate nature, and nature is immanently wise, subject to cycles, the alternation of which ensures order and harmony. The desire for a harmonious life determines the specifics of the worldview of the characters, who strive to distance themselves from chaos and bring the *transcendental* harmony in the human world closer to the cosmic order that determines the sunrise and sunset, tides and other natural cycles. And it is precisely such natural laws that ensure the stability of existence that is often shaky in the social space. Therefore, the ideal for the characters exists not in social institutions, but in the feeling of what exists outside the word, in approaching the energy that has a relationship with nature, because nature is not oriented to self-destruction, but only to existence, to self-development and continuation, which will continue until, as long as the world exists.

In Korotko's stories, a closed, cyclical chronotope is presented, which is generally subordinated to the narrator's intention to mythologize the Odesa space. The sea, the geographical loci of Odesa, often marked historically, are parts of the universal-mythological topos of Odesa that grows out of an ancient, spontaneously conditioned mythological substrate. Mythology is also facilitated by the way the characters are portrayed: they often pretend to be active, although they are involved in various life conflicts that are of a trivial nature. In fact, the characters are immersed in the *otium* and *negotium* of Odesa, its *leisure* connected with special worldview guidelines.

Moreover, an important component of the compositional design of these stories in *Bera…* is the description of the landscape. The characteristics of the exterior and natural landscapes become an important factor in the mythologizing of the narrative, a form of representation of the immanent and eventual connection between human beings and nature that sometimes cannot be explained verbally. In this way, a mystical image of the inner world of a person, revealed in the bosom of nature, is presented, and this revelation is represented not in language, but in the deep states experienced by the characters. Outwardly, they exist in various social configurations that do not relate to the multidimensional inner spiritual life of Odesites. The short stories present various philosophical models of the worldview of the heroes: kabbalistic and Eastern, connected with Turkish melancholy, self-absorbed contemplation.

Odesa does not demand sacrifices. The doors and windows of heroism are boarded up and you sleepwalk through tunnels of the unconscious in the deaf hermetic space of solitude and along streets of childhood and youth, in the carapace of a lethargic dream of recollections, breathing in the aroma of past life. But alongside are people, many people; they move and orbit, as the Earth does the Sun. You can touch them mentally and even pinch them, but they will not feel any pain – they are from another reality. You will plunge into the sediment of the broth of student life, but even there you are absent (Korotko, 2023, p. 28).

The external dimension has little weight in this case: Odesa in Korotko's exists as a *transcendental*, immanently unchanging space that arose near the eternal elements and that has a connection with myth. Social processes reflect people's lives, but the emphasis in the book is not on them at all. The space of social interaction is marked by irony, descriptions of landscapes reflect the principle of static depiction of elements that are immovable in time, eternal in space, and therefore, people living near the sea are depicted as an organic continuation of these elements.

Furthermore, Odesites in these short stories are an anthropological model of the manifestation of the spirit that is invisibly represented in natural elements. A human being in these stories is not different from the elements of nature, but their organic continuation. Korotko emphasizes that the special spirit that was discussed by the classics of German philosophy, in particular Hegel, constantly wanders from one epoch to another, and in the Christian paradigm it realizes itself in the human dimension, developing and improving at each turn of the spiral.

In Korotko's stories, there is a lot of humanism that stems from the Christian instructions of the New Testament, but at the same time there are archetypal models of the image of the world through the basic archetypal images of the eye, shadow, house, road (in the system of Jungian approaches), etc. The possibility of using archetypal reconstruction is determined precisely by the general intention of the narrative to mythologize. The characters are creatures, but at the same time, mannequins born of the elements of nature that fall asleep at nightfall and come to life with the tides of the Black Sea. The narrator shows that the psychological state of Odesites, the rhythms of their life correlate with the rhythms of the sea.

The writer reconstructs Odesa identity, searching for an existential dimension, demonstrating not social identities as the basis of Odesa space, but through attempts at archetypal reconstruction of characters. O. Korotka's story is an attempt to write the history of Odesa that is represented through the micro-histories of the heroes, whose names are often included in the chapter titles. In fact, it is about an anthropological story, passed through the destinies of the heroes. When we read these narratives, we understand how much the characters are, as it were, heroes-components of one common myth. From this we reconstruct the general myth of Odesa as a primeval space in which nature weighs. Moreover, we observe a special *anthropocene* way of depicting reality connected with the display of characters as beings who minimize their activity in the external social manifestation, but live an intense inner psychological life that can be characterized as being: it is marked by value, directly related to the Odesa narrative and is part of the Odesa myth. Thus, under *the Odesa myth* in *Bera…*, we understand a narrative in which a person exists in inseparable unity with nature, with the historical memory of Odesa that is realized through the loci of the city where the characters live. This is the space of immanent connection between human beings and the elements. The characters are absorbed in themselves, they look at the world contemplatively and melancholy, realizing that they are only variables, only travelers, components of the great macrocosm of Odesa, in which there are different realities, hidden gaps between which non-linear connections are formed.

I'm even afraid to describe my feelings, so as not to dissipate that spiritual state which had made me an invisible man. At those moments everything was subordinate to my imagination. I took advantage of this without ceremony, even abused it, but tried very hard, by the end of breakfast, to return to the body which had been cast to the whims of fate, to breathe life into it and begin the existence of an ordinary person (Korotko, 2023, p. 38).

Finally, it is impossible to perceive Odesa identity linearly, in the categories of logocentrism. Ultimately the archetype realizes itself through imagery, but it is never really possible to verbalize what the archetype itself is. This is an ancient model of the functioning of the universe as a macrocosm of matter and energy, realized in the depiction of characters and the sea in *Bera and Cucumber*, where the Odesa identity appears as a special type of *Otherness*, as a potentiation of the mythological narrative that has a connection with an ancient myth.

Conclusions

In *Bera and Cucumber*, Korotko depicts Odesa as a mythological topos. The chronotope has a cyclical nature, the characters subordinate their own lives to natural cycles that determine the peculiarities of the connection between man and nature in the Odesa space. Such a connection has an archetypal character and a mythological nature: from a social point of view, the characters appear to be simulacra, but their inner psychological world should be defined as a space of being: it has its own axiology. The psychological characteristics of the Odesa world are marked by multidimensionality: they combine various worldviews and philosophical traditions, in particular, they perceive the world in the categories of natural philosophy, cabalistic multifaceted dimension, and Turkish *melancholy*. The interaction of the characters with the sea indicates that, in these narratives, there is no traditional division into subject and object relations. Such a feature that contemporary scholars define as anthropocene, only confirms the mythological orientation of the entire narrative, since the lack of such a division into subjects and objects is characteristic of mythological thinking. The characters try to experience and find deep existential happiness in their leisure time that fills their inner world with essential axiology, that is, values that are timeless in nature. The Odesa myth in Korotko's *Bera…* is presented as a timeless myth that has its representation in the socio-urbanistic dimension marked even in the names of districts, historical realities and loci of Odesa, but the most important here are the relations of human beings with the elements of nature.

Furthermore, such correlations have an archetypal and mythological nature: the short stories present the archetypes of the Eye, realized in the system of twins, the archetype of the Road and the archetype of the Home. Odesa space appears as a cozy home, a comfortable existence, for which the concept of peace is decisive.

The writer skillfully inscribes the Odesa narrative into the multicultural space of interaction of Jewish traditions with specifically Ukrainian ones, with Turkish melancholy and mythological natural philosophy. However, in general, we have a tendency to derive the Odesa text from the paradigm of the Russian narrative that indicates that the Russian culture that incorporated the Odesa narrative into its own indicates its exoticism and otherness. The concept of *otherness* is certainly present in Korotko's stories, but the otherness of Odesans, Odesa psychology and identity has an immanent nature and is not connected with the Russian myth that for centuries sought to colonize the Odesa narrative. In the end, such a break with the colonial tradition is indicated by the translation strategy of Michael Pursglove, who in the English translation uses the word 'Odesa' with one 's' that corresponds to the Ukrainian tradition of writing this city name.

Thus, *Bera and Cucumber* is an example of the post-postmodern postcolonial Ukrainian fiction that reveals the Odesa space as possibly mythological, for which the concepts of peace, happiness, leisure, melancholy, harmony, and the unity of human beings with nature are decisive. And this representation of the Odesa myth contradicts the Russian colonial policy that today already in the sociopolitical dimension has led to numerous attacks on Odesa, the destruction of this city that for decades Russian culture tried to incorporate into its own imperial body, manifesting Odesa as Southern Palmira as opposed to Northern Palmira, i.e. St. Petersburg. The narrative strategies used by the narrator reveal the immanent *Otherness* of Odesa that stems from the special Odesa socio-cultural and religious identity that is based on a harmonious combination of various philosophical and worldview traditions.

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From high-performance work systems to retention: The engagement, proactivity, and performance bridge

والأداء والاستباقية المشاركة جسر :الاحتفاظ إلى الأداء عالية العمل أنظمة من

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Abstract

This quantitative study explores the effects of high-performance work systems on employee retention through individual factors such as job engagement, employee proactive behavior, and employee performance. The study utilizes a sample of 279 employees employed in the healthcare sector in Saudi Arabia. For hypotheses testing, structural equational modeling was used through SmartPLS4. The findings highlight the influence of HPWS on increased employee proactive behavior, employee performance, and job engagement, resulting in increased employee retention. Additionally, a serial indirect effect of employee proactive behavior, job engagement, and employee performance was found to positively influence the relationship between high-performance work systems and employee retention. High-performance work systems can promote job engagement in Saudi organizations by offering challenging work, autonomy, skill development, and performance feedback. Engaged workers stay longer. Job engagement promotes a positive work environment and community, which increases employee retention. Employee proactive behavior also makes employees feel valued and invested in their work, which can increase retention. The study enhances current knowledge on the role of high-performance work systems in the Saudi healthcare sector considering Vision 2030 by examining the potential mediators between high-performance work systems and employee retention.

Keywords: High-performance work system, job engagement, employee proactive behavior, employee performance, employee retention.

خلاصة

سلوك ,الوظيفي كالاندماج فردية عوامل خلال من الموظفين استبقاء على الأداء العالية العمل أنظمة تأثير الكمية الدراسة هذه تستكشف
العربية بالمملكة الصحية الرعاية بقطاع يعملون موظف 279 من عينة الدراسة استخدمت .الموظفين وأداء ,الموظفين لدى المبادرة
SmartPLS 4 برنامج خلال من الهيكلية المعادلات نمذجة استخدام تم ,الفرضيات لاختبار .السعودية
مما الوظيفي واندماجهم ,الموظفين أداء ,الموظفين لدى المبادرة سلوك زيادة على الأداء عالية العمل أنظمة تأثير على الضوء النتائج تسلط
الاندماج ,الموظفين لدى المبادرة لسلوك مباشرة الغير الإيجابية التأثيرات من سلسلة وجود ,إضافةً .الموظفين استبقاء في ارتفاع عنه ينتج
تعزز أن الأداء عالية العمل لأنظمة يمكن .الموظفين واستبقاء الأداء عالية العمل أنظمة بين العلاقة على الموظفين أداء و ,الوظيفي
.الأداء من راجعة وتغذية ,مهارات تطوير ,استقلالية ,تحدي تتطلب أعمال تقديم خلال من السعودية المنظمات في الوظيفي الاندماج
,أيضاً .الموظفين استبقاء من يزيد مما إيجابي ومجتمع عمل بيئة تعزيز في الوظيفي الاندماج يساهم .أطول فترة يبقون المندمجين الموظفين
الدراسة تعزز .استبقاءهم من يرفع أن الممكن من وذلك عملهم في مستثمرون وأنهم بالقيمة يشعرون يجعلهم الموظفين لدى المبادرة سلوك

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رؤية الاعتبار عين في الأخذ مع السعودية العربية بالمملكة الصحية الرعاية قطاع في الأداء عالية العمل أنظمة دور عن الحالية المعرفة الموظفين واستبقاء الأداء عالية العمل أنظمة بين المحتملة الوسيطة المتغيرات فحص خلال من وذلك 2023 المملكة.

كلمات مفتاحية: الموظفين استبقاء ,الموظفين أداء ,الموظفين لدى المبادرة سلوك ,الوظيفي الاندماج ,الأداء عالية العمل أنظمة

Introduction

High-performance work systems (HPWS) are integrated human resource methods that boost employee productivity and performance. HPWS is also called a high-commitment work system, high participation work system, and efficient human resource management (Zhu et al., 2018).

HPWS requires selective hiring, employment security, decentralization of decision-making, extensive training, information sharing, and fair compensation (Zhang, 2019).

An employee's proactive behavior (EPB) improves the workplace. Proactive employees solve problems, suggest improvements, and change organizations (Wu, 2019). These employees have better career and personal outcomes, which improves organizational development and performance. Proactivity is essential to an organization's success (Al-Tit, 2020).

Organizations need job engagement (JE) to boost employee performance, retention, and output. Engaged employees help organizations achieve their goals (Anitha, 2014). Organizations should provide recognition, development, and communication to boost employee engagement (Jaharuddin & Zainol, 2019).

High turnover costs and disrupts a company, so employee retention (ER) is crucial. Organizations should promote work-life balance, a positive work environment, competitive compensation and career development, and exceptional performance to increase JE (Papa et al., 2020). HPWS improves JE, but employee proactivity may also improve it. Proactive employees may boost performance and retention, but only sometimes. Employee proactivity, performance, and retention must be clarified beyond HPWS and JE.

The current study proposes that HPWS (i.e., staffing, training and development, compensation, performance management, career development, and information sharing) influence employee proactive behavior (e.g., problem-solving and identification of opportunities). As a result, employees will engage more in their work and organizational activities by being more enthusiastic regarding their work activities and focusing on their job. The study also claims that engaged employees have the higher task and contextual performance resulting in employee's willingness to stay with the organization for a longer period.

Saudi Arabia needs HPWS to succeed in infrastructure and economic diversification. HPWS will help Vision 2030 by improving productivity, innovation, and competitiveness through JE, creativity, and continuous improvement. Vision 2030 and the National Transformation Program are increasing private-sector healthcare contributions in Saudi Arabia. By 2030, the number of licensed medical institutions, privatized government services, healthcare, IT, digital records, and qualified Saudi nurses will increase (Rahman & Al-Borie, 2021). This improves operational efficiency, product and service quality, and market adaptability.

Literature review

High-performance work systems

High-performance work systems (HPWS) are several performance-enhancing activities included in a collection of distinct but linked HR practices that are intended to improve employees' abilities and efforts. HPWS, also called high commitment work practices, high participation work practices, and best HR methods (Zhu et al., 2018). HPWS is a set of HR practices that boost employee productivity, performance, loyalty, and skills, making utilization of human resources to gain an ongoing competitive advantage (Zhu et al., 2018; Pak & Kim, 2016). HPWS's main components are selective hiring, employment security, decentralized decision-making, extensive training, information sharing, and fair payment (Li et al., 2019; Zhu et al., 2018).

Employee's proactive behavior

In the organization, proactivity is a way for employees to improve or change their work environment (Al-Tit, 2020, Arefin et al., 2015). Wu et al. (2019) defined a proactive employee as one who introduces or applies new work ideas, makes suggestions to improve the work environment, and identifies and solves work performance issues. Such an employee improves organizational effectiveness and career development for himself and the organization (Al-Tit, 2020).

HPWS gives employees resource entitlements. This may be especially beneficial for low-proactivity workers, who may be less inclined to negotiate special arrangements and may rely heavily on HPWS's more structured, collective approach to motivate them (Zhang et al., 2019). HPWS affects EPB because it is linked to positive work behaviors. Proactive employees will get more resources and work better with HPWS. Thus, proactive employees need HPWS to improve performance (Martín et al., 2017). HPWS increases EPB by improving employee motivation, abilities, and performance (Martín et al., 2017). HPWS promotes human capital through recruitment and training and attracts talent through competitive compensation (Teo et al., 2020). As HPWS develops KSA, employees are more likely to take positive action, believing they can improve their work and efficiency (Shin & Jeung, 2019). Thus, the following hypotheses state:

H_1: High-performance work system has a positive and significant impact on employee proactive behavior.

Job engagement

Job engagement is a positive attitude toward the organization and its beliefs (Jaharuddin & Zainol, 2019). JE also refers to the harnessing of engaging employees to their job responsibilities, so when performing at work, people use their bodies, minds, and feelings for expressing themselves. (Ozyilmaz, 2020). It involves enthusiasm, dedication, and absorption while allocating personal resources and energy to work (Eldor et al., 2020).

Conservation of resources (COR) theory states employees invest resources in coping with risky conditions and defending against resource loss to preserve and acquire resources (Hobfoll et al., 2018). When they do not perform well, people get stressed and take more proactive measures to maintain their jobs and stay engaged. They must work hard and be proactive in their careers (Jang et al., 2020).

H_2: Employee proactive behavior has a positive and significant impact on job engagement.

Employee performance

Employee performance is a multidimensional phenomenon and a significant element in determining the success or failure of an organization (Sendawula et al., 2018). It covers positive and negative employee activities and behaviors that help achieve the organization's objectives (Singh, 2016). Employee performance is one of the most significant organizational outcomes in work and organizational psychology (Diaz-Vilela et al., 2015). Task and contextual performance are its two main dimensions (Khalid, 2020).

Task performance supports technological core procedures and maintenance, characterized as employee efficacy to achieve organizational goals. Contextual performance effects organizational tasks through contributing to the organizational environment and culture. It involves conflict resolution, and interpersonal cooperation (Sendawula et al., 2018; Khalid, 2020).

Engaged employees exhibit various productive behaviors that enhance synergetic team efforts toward organizational goals (Breevaart et al., 2015). These synergistic efforts boost employee performance (Bakker, 2017). Engaged workers can spread their feelings throughout the organization, which drives their efforts and performance (Bakker & Demerouti, 2014). High JE helps employees handle more work and improve their performance. High JE, persistence, and task focus improve performance (Bal & De Lange, 2015).

H_3: Job engagement has a positive and significant impact on employee performance.

Employee retention

Employee retention refers to the many steps organizations take to retain employees (Papa et al., 2020). Das & Baruah (2013) emphasized that encouraging employees to stay if possible or until the project is finished is the key to success. Industrial globalization has changed employee attitudes toward their organizations. Thus, organizations must retain educated and skilled workers during high turnover (Diah et al., 2020). Retention depends on many factors, including peer support (Ali et al., 2017), recruitment and selection, job preview, awards and recognition, work–life balance, training and development, transformational leadership, and organizational citizenship behavior (Tian et al., 2020).

Nguyen & Duong (2021) found that motivated, competent, and skilled people perform well, which is important for an organization's competitiveness and employee retention. This shows that employees will stay if they feel accomplished (Alshery & Ahmad, 2016). According to Syahreza et al. (2017), if a business manages employee maintenance well, employees will be disciplined, loyal, and work ethic. Maslow's theory of motivation suggests that employees who are satisfied with their needs will be motivated to meet higher-level needs. Retaining staff will motivate them to perform better to meet increased demands (Papa et al., 2020).

H_4: Employee performance has a positive and significant impact on employee retention.

When any organization applies HPWS then this will lead to influence and effect the performance of employees (Karadas & Karatepe, 2018). HPWS elicit desirable behavior and attitude from employees, such as a desire to learn, an awareness of the objective of their work, an increase in engagement, and proactive initiatives (Jang et al., 2020). These employee actions and attitudes establish a connection to the organization and ensure that the employee will continue to work for the organization while generating effective performance (Bal & De Lange, 2015).

Among the multiple benefits of JE, effective EP, and ER stand out, as engaged employees tend to be more devoted to the organization and its objectives, which leads to enhanced EP and improved outcomes (Pandita & Ray, 2018). JE relates to creativity, workplace vigor, EP, and greater ER (Bal & De Lange, 2015).

Maden (2015) explains the existence of a relationship between HPWS and ER. This relationship is serially mediated by an employee's proactive behavior and JE. Using the principle of conservation of resources (COR), we can construct this relationship (Jang et al., 2020). Some employees may become stressed when they do not perform well; therefore, they will be motivated to improve their proactive behavior so that they are engaged with their work and strive to demonstrate proactive behavior. Consequently, the effect of JE will have a mediated effect on employee performance. There is a favorable connection between JE and EP (Pandita & Ray, 2018). Therefore, we hypothesized:

H_5: The relationship between a high-performance work system and employee retention is serially mediated by employee proactive behavior, job engagement, and employee performance.

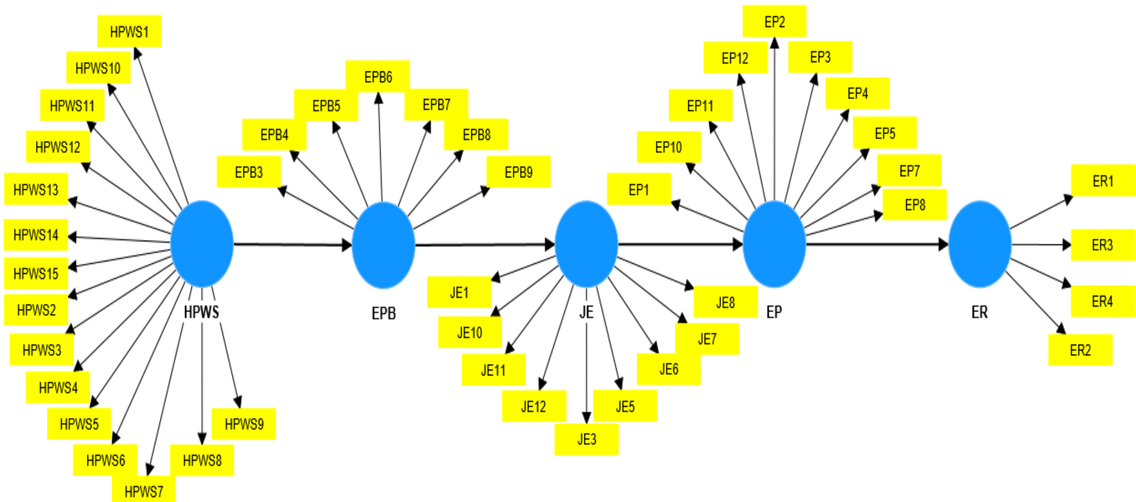

Figure 1. Theoretical Model

Methodology

Data Collection

This research used a quantitative analysis method. Data were collected in three phases from June 1, 2023, to December 30, 2023, with two months between each phase. The first phase collected demographic and HPWS data. The second phase collected JE, EPB, and EP data. In the final phase, ER data were gathered. Research assistants and healthcare friends collected the data. To translate scale items from English to Arabic, a special translator officer translated the questionnaire by using back-to-back translation method. With language experts and pilot testing, sentence meanings were preserved during translation. During the translation process, it was assured with the help of language experts and pilot testing that the meanings of the sentences do not lose their essence.

Sample and procedure

Saudi doctors, nurses, and administrative staff in public and private healthcare were surveyed using a hard copy and soft copy self-administered survey. Data were collected from Saudi Arabia's four largest cities (i.e., Jeddah, Makkah, Madinah, and Riyadh). The hospital's ethics committee and HR department approved the questionnaire before distribution. This study used purposive sampling. The present study used purposive sampling to select participants most likely to know about the research area so that it can enhance study relevance and accuracy. Thus, sampling aims to represent the population accurately. All variables in this study apply to the healthcare industry to avoid sampling errors caused by data collection and processing errors. A total of 400 questionnaires were distributed in five largest hospitals (i.e., based on numbers of beds), from each city. Twenty questionnaires were distributed to participants (i.e., doctors, nurses, and administrative staff) in each hospital. The questionnaires were personally distributed by email and postal service. Those who did not respond were contacted through three polite reminders, each separated by one week until no further communication was received. To maintain the participant's privacy, empty envelopes were supplied to those who submitted their responses using personal administration or email.

To minimize social desirability bias and common method variance, several strategies were implemented. These included assuring respondents that their information would be used solely for research purposes and would be kept strictly confidential. Additionally, the dependent and independent variable distribution occurred in separate phases and sections. Additionally, the data was gathered in stages to prevent respondents from establishing associations between their responses and other variables. In the first phase of data collection (including demographic variables, and HPWS items), 384 responses were received. In the second phase of data collection (), 327 responses were received. However, in the last phase, a total of 279 responses were received for final data analysis. From all the three phases of data collection, incomplete responses were removed. After conducting Cook and Leverage distances test (i.e., by removing outliers) only 260 usable responses remain.

The HPWS variable was measured with its dimensions (i.e., selective staffing, internal mobility, employment security, clear job description, and result-oriented appraisal) through a 15-item scale developed by Sun et al. (2007). Employee performance was measured including its two dimensions (i.e., contextual performance and task performance) through a 13-item scale developed by Koopmans et al. (2013). JE was measured through a 12-item scale, which was developed by Drake. (2012). EPB was measured by using 9-items scale developed by Bateman et al. (1993). Whereas, ER was measured through 7-items scale developed by Egan et al., (2004) and Kassim (2006). All variables were measured on a 5-point Likert scale with 1 being strongly disagreed and 5 strongly agree.

SmartPLS 4 and SPSS version 29 were utilized to perform the data analysis. When examining and predicting variables, partial least squares structural equation modeling (PLS-SEM) is highly recommended (Hair et al., 2020).

Results and discusión

Descriptive and Correlation Statistics

The demographics indicated that there were 71.4% men and 28.6% women. Most participants (40.3%) were between the ages of 40 and 50, held bachelor's degrees (61.9%), were married (82.1%), and had worked for the same organization for over 20 years (45.3%). Most participants were employed in healthcare.

Table 1.
Descriptive Statistics and Pearson Correlation Analysis

Descriptive Statistics			Pearson Correlations Analysis				
	Mean	SD	HPWS	JE	EPB	EP	ER
HPWS	3.586	0.465	1				
JE	4.057	0.375	.474**	1			
EPB	3.950	0.422	.436**	.594**	1		
EP	3.805	0.426	.394**	.607**	.583**	1	
ER	3.818	0.541	.595**	.510**	.435**	.521**	1

Note: **. Correlation is significant at the 0.01 level (2-tailed).

Table 1 displays the correlations between HPWS, JE, EPB, EP, and ER. JE is significantly correlated with EPB (r = 0.594**), EP (r = 0.607**), and ER (r = 0.510**). There is a significant correlation between employee performance, EPB, and ER (r = 0.583**, 0.435**, respectively).

Assessment of reflective measurements

To ensure the validity and reliability of the study scale, Confirmatory composite analysis (CCA) is used (Henseler et al., 2014). Table 2 assessment of reflective measurement displays the factor loadings for each research variable. The findings show that each of the factor loadings is more than the cutoff value of 0.40. (Hair et al., 2020). As shown in Table 2, for all items, factor loading ranges from 0.419 to o.817. According to studies by Hair et al. (2021), the reliability values (Cronbach alpha, Rho-A, and composite reliability) should exceed 0.7, and the values for the AVE must be higher than 0.5.

Table 2.
Assessment of Reflective Measurement

Items	Type	Loadings	CA	rho-A	CR	AVE	VIF
HPWS1-HPWS15	Reflective	0.457-0.756	0.871	0.879	0.891	0.557	1.289 - 2.462
EPB3-EPB9	Reflective	0.419-0.559	0.834	0.843	0.875	0.501	1.409- 1.770
JE1-JE12	Reflective	0.645 - 0.817	0.898	0.904	0.917	0.552	1.699 -2.548
EP1 - EP12	Reflective	0.491-0.632	0.842	0.854	0.876	0.514	1.356 - 1.894
ER1 - ER4	Reflective	0.697 - 0.738	0.781	0.785	0.897	0.511	1.252 - 1.319

Note: CA= Cronbach alpha; CR = Composite reliability; AVE = Average variance extracted; VIF = Variance inflation factor

The range of the CA level is between 0.781 and 0.898. rho_A's levels fall between 0.785 to 0.904. As a result, the coefficients of CR fall between 0.875 to 0.917. The chosen measures' validity is supported by the AVE numbers (0.501 – 0.557), because each of them is greater than 0.5. (Hair et al., 2020). By demonstrating that each variable has significant inter-scale relations that meet the requirements for convergent validity. Multicollinearity is not a problem in this analysis because collinearity diagnostics were also carried out, and all variance inflation factor (VIF) values were far below 3 (Table 2).

Discriminant validity

Fornell-Larcker and Hetro-Trait Mono-Trait criteria are used to measure discriminant validity (Gannon et al., 2021). According to the findings in Table 3, Fornell–Larcker criterion and heterotrait-monotrait (HTMT) demonstrate that the data's discriminant validity is acceptable. Acceptable HTMT values should be less than 0.85, according to research conducted by Henseler et al. (2014). The square root of the construct's AVE must be greater than the correlation values for all the constructs for the Fornell-Larcker criterion results to be considered acceptable (Fornell & Larcker, 1981).

Table 3.
Discriminant Analysis (HTMT and Fornell-Larcker Criterion)

	Hetro-Trait Mono-Trait (HTMT) Criterion					Fornell-Larcker Criterion				
	HPWS	**JE**	**EPB**	**EP**	**ER**	**HPWS**	**JE**	**EPB**	**EP**	**ER**
HPWS						**0.746**				
JE	0.529					0.488	**0.743**			
EPB	0.479	0.695				0.453	0.622	**0.707**		
EP	0.438	0.705	0.605			0.413	0.628	0.677	**0.716**	
ER	0.528	0.742	0.443	0.705		0.431	0.593	0.665	0.697	**0.715**

Note 1: The bold numbers in diagonal in Fornell- Larcker section are square root of AVE of each construct, and other numbers are correlation between constructs.

Hypothesis testing

Table 4 shows the results of testing our hypothesis that was used for the study. HPWS strongly impacts EPB positively, according to calculations of the direct link between the two factors (β = 0.453, t-value =12.326, $p < 0.000$) Thus, H1 was supported. Similarly, table 4 emphasizes the direct influence of EPB on JE (β = 0.622, t-value = 14.312, $p < 0.000$), thus showing a strongly significant and positive impact of EPB on JE. Thus, supporting H2. While, JE has a significant and positive impact on EP (β = 0.628, t-value = 14.490, $p < 0.000$), this supports H3. Moreover, the EP has a significant and positive impact on ER (β = 0.799, t-value = 32.180, $p < 0.000$), these results support H4.

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Table 4.
Hypothesis Testing

Hypo-thesis	Direct / Indirect Effect	Path Coefficient	T Value	P Value	Bias	BCCI		Hypothesis Support
						5.00%	**95.00%**	
H_1	HPWS -> EPB	0.453	12.362	0.000	0.016	0.366	0.509	Supported
H_2	EPB -> JE	0.622	14.312	0.000	0.007	0.518	0.694	Supported
H_3	JE -> EP	0.628	14.490	0.000	0.006	0.53	0.700	Supported
H_4	EP -> ER	0.797	32.180	0.000	0.002	0.735	0.837	Supported
H_5	HPWS -> EPB -> JE -> EP -> ER	0.141	5.372	0.000	0.01	0.089	0.185	Supported

Note: High Performance Work Systems (HPWS); Job Engagement (JE); Employee Proactive Behavior (EPB); Employee Performance (EP); Employee Retention (ER); Bias Corrected Confidence Intervals (BCCI).

The product coefficient approach (indirect effect) was used to explore the potential mediation effects of EPB, JE, and EP. Using bias-corrected bootstrap confidence intervals (CI), the significance of the indirect effects was evaluated (Gannon et al., 2021). For the sequential mediation between HPWS and ER through EPB, JE, and EP, the results show that the impact of HPWS on ER is sequentially mediated by EPB, JE, and EP [□ = 0.141, $p < 0.000$, CI = (0.089, 0.185)], hence proving H5. Nevertheless, as the HPWS rises, the projected direct relationship's direction shifts, indicating that as ER rises, so do the levels of JE, EPB, and EP. This illustrates the importance of ER's effect on sequential mediation.

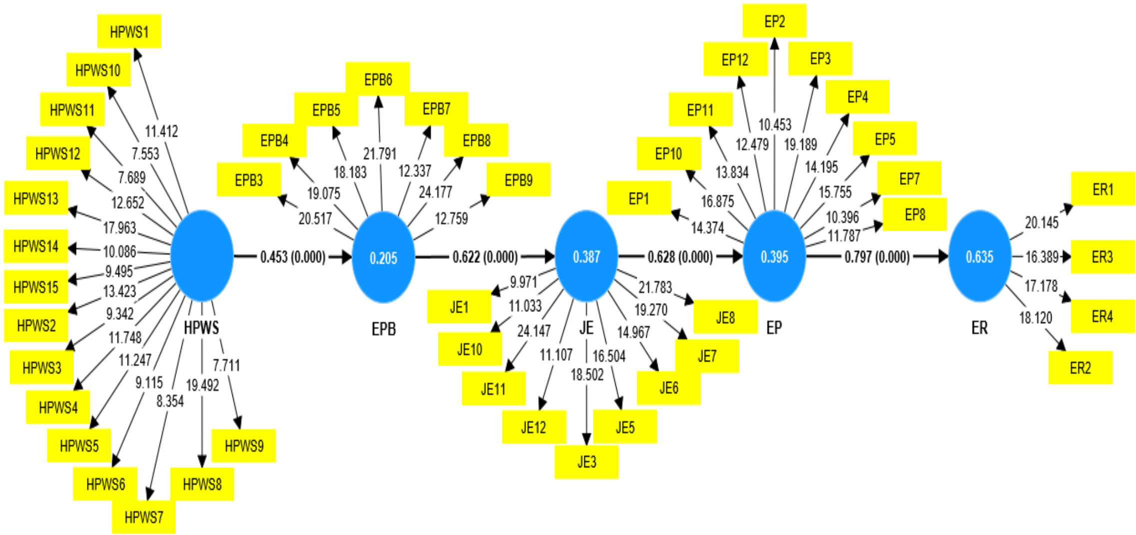

Figure 2. Results (Hypothesis Testing)

Model evaluation

The findings of the assessment of the structural model are presented in Table 5. Evaluation of a model's predictive ability should mainly concentrate on one major target variable which is (HPWS). Construct cross-validity redundancy is displayed in Table 5. Numerous criteria were used to explain and predict the fluctuation in endogenous variables caused by exogenous variables (HPWS), as recommended by (Hair et al., 2020). The fact that all the Q2predict are significantly more than (0.00) for NFI must be (greater than 0.90), and the SRMR score should be (less than 0.08). As we can see in Table 5 the endogenous variables (EPB, JE, EP, and ER) are having a large predictive relevance as Q2predict values for all the endogenous variables is higher than 0.350, means that the study model accurately represents the empirical data and has a great capacity for prediction (Shmueli et al., 2019). Regarding the value of SRMR, it is (0.078) and the NFI value is (0.919) this gives additional proof that the model fit is sufficient.

Table 5.
Model Evaluation

Variables	SRMR	NFI	Q^2 Predict	Q^2 Effect
High Performance Work Systems				
Job Engagement			0.364	Large
Employee Proactive Behavior	0.078	0.919	0.483	Large
Employee Performance			0.395	Large
Employee Retention			0.461	Large

Note: SRMR (Standardized Root Mean Square Residual); NFI (Normed Fit Index); Q^2 for Predictive Relevance

This study aimed to investigate the sequential mediation process that links HPWS to ER by looking at the roles of EPB, JE, and EP. The results obtained provide empirical evidence of a significant indirect sequential mediation effect of HPWS on ER via these mediators. It was discovered that HPWS influences EPB positively, suggesting that organizations with effective work systems are more likely to encourage employees to take initiative. This finding is consistent with prior research highlighting the positive influence of HPWS on employee behaviors and attitudes (Arefin et al., 2015; Karadas & Karatepe, 2018; Li et al., 2019; Zhang et al. 2019). The positive relationship between EPB and JE suggests that proactive employees are more likely to be engaged in their work, contributing to their overall job satisfaction and organizational commitment (Jang et al., 2020; Hobfoll et al., 2018).

Moreover, JE was positively associated with EP, highlighting the significance of the psychological state of employees in enhancing their performance. These results are consistent with previous research demonstrating the positive impact of JE on a variety of organizational outcomes (Bal & De Lange, 2015; Jaharuddin &

Zainol, 2019; Pandita & Ray, 2018). The results indicate a positive correlation between JE and EP, indicating that engaged employees tend to demonstrate higher levels of performance in their roles. This finding supports previous research showing a positive correlation between JE and EP (Chada et al., 2022).

Overall, the results of this study demonstrate the importance of HPWS in fostering EPB, which ultimately results in increased JE and enhanced EP. In addition, the sequential mediation model demonstrates that EPB, JE, and EP mediate the relationship between HPWS and ER.

Theoretical implications

HPWS is designed to provide employees with a range of resources and benefits that can increase their motivation and commitment to the organization (Zhu et al., 2018). HPWS may provide employees with opportunities for skill development, feedback on their performance, autonomy in decision-making, and access to valuable information and resources (Sun et al., 2007). Social exchange theory (SET) states that these resources and benefits can be seen as "inputs" that employees contribute to their organization, with the expectation of receiving "outputs" in return, such as job security, career advancement, and other forms of recognition or compensation (Blau, 2017). When employees perceive that their organization is meeting their expectations and providing them with valuable inputs and outputs, they are more likely to engage in proactive behaviors (Cropanzano et al., 2017; Imran & Atiya, 2020). The SET implies that HPWS can positively influence ER through EPB, JE, and EP by providing employees with valuable resources and benefits (Tian et al., 2020). When employees perceive that their organization is investing in their development and well-being, they are more likely to reciprocate by engaging in positive work behaviors, which can contribute to their retention (Jang et al., 2020; Teo et al., 2020).

Practical implications

HPWS involve a collection of HR processes intended to enhance organizational performance by stimulating employee skills, motivation, and involvement. In the healthcare sector, where employee retention and turnover are key issues, understanding the association among HPWS, JE, EPB, and performance is crucial. The research findings on HPWS recommend that organizations that implement these practices can attain a wide range of benefits, including increased productivity, profitability, EP, and ER.

In Saudi Arabia, organizations can implement HPWS and can improve the quality of human capital by promoting employee development and training. This is particularly important in Saudi Arabia, where there is a shortage of skilled workers in certain industries. HPWS can help organizations to attract and retain talented employees by offering opportunities for career advancement and skill-building.

The implementation of HPWS can have a positive impact on ER in Saudi organizations through the promotion of JE, EPB, and EP. HPWS can promote JE by providing employees with challenging work, autonomy, opportunities for skill development, and feedback on their performance. Engaged workers are more committed and loyal to the organization because they feel purpose and satisfaction. Thus, HPWS can boost JE in Saudi Arabian healthcare organizations, lowering turnover and retaining talent. Therefore, by promoting JE, organizations may foster a supportive workplace culture and a feeling of belonging within their workforce, leading to increased retention.

Employee proactivity is a significant factor in determining ER. A HPWS encourages employees to be proactive, creative, and engaged. HPWS can foster ownership and involvement by letting employees speak up, make decisions, and solve problems. Valued and empowered employees are likelier to take the initiative and improve their workplace. This EPB fosters employee loyalty and ownership. Encouraging EPB also helps employees feel more invested in their work and feel that their contributions are valued, which can lead to increased retention.

The relationship between EP and retention is strong. HPWS emphasize skill development, feedback, and performance standards. Saudi healthcare organizations can improve staff skills by investing in training and development. Engaged and proactive employees with the right skills and resources perform better and provide better patient care. Employee performance improves organizational outcomes, job satisfaction, and turnover intentions. HPWS can help Saudi Arabian healthcare organizations retain skilled and motivated employees by increasing job engagement, proactive behavior, and performance. This improves organizational performance, patient care, and workforce sustainability.

Future direction and limitation

The results above have several limitations. First, data were collected in three two-month phases. Cross-sectional studies show temporal causation but not causality. Thus, future studies should test for reversed effects and validate the conceptual model's hypotheses using cross-lagged panel or longitudinal designs. Second, we conducted an individual-level evaluation of HPWS. Complex organizations with many managers and non-managers may have HPWS agreement issues due to within-group and between-group agreements. Thus, future studies may need a multi-level approach to agreement issues. Thirdly, information was gathered from the Saudi Arabian health sector. Limits generalization. Our HPWS may not be as important in other service scenarios as in health. Future research should tailor HPWS to the sample-taking service. Finally, including turnover and absenteeism in the model would help future studies.

Conclusion

The research indicates that HPWS have an important and positive effect on EPB, JE, EP, and ER in the healthcare industry of Saudi Arabia. This study results emphasizes the wide-ranging benefits of HPWS that range beyond its direct impacts. This sequential mediation underscores the significance of job engagement and proactive behaviors in utilizing HPWS to improve retention and performance. The results also depict that HPWS can significantly improve the healthcare industry's capacity to provide high-quality care by fostering a stable and engaged workforce by promoting a supportive work environment.

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Gamification in the educational process of higher education institutions

Гейміфікація в освітньому процесі закладів вищої освіти

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Abstract

The article theoretically reveals the content of the terminological apparatus of gamification. The purpose of the article is the need to introduce and study the most effective ways of introducing gamification into the educational process of higher educational institutions for the preparation of a competitive young generation. The methodological concept reflects the relationship and interaction of the use of gamification methods in the educational process of higher education institutions, in particular the use of various components (motivational, meaningful, active, and reflective components). The results show the main directions of influence and structural elements of gamification; the main areas of influence of gamification on the educational environment are clarified; six steps of game mechanisms for introducing gamification into the educational space are described; the importance of implementation, negative manifestations of gamification for the educational process are shown, and the main aspects of gamification are revealed. The most

Анотація

У статті теоретично розкрито зміст термінологічного апарату гейміфікації. Метою статті є необхідність впровадження та вивчення найбільш ефективних шляхів впровадження гейміфікації у навчальний процес вищих навчальних закладів для підготовки конкурентоспроможного молодого покоління. Методологічний концепт відображає взаємозв’язок і взаємодію використання шляхів гейміфікації в освітньому процесі закладів вищої освіти, зокрема використання різних компонентів (мотиваційний, змістовний, діяльнісний і рефлексивний компоненти). У результатах показано основні напрями впливу та структурні елементи гейміфікації; з’ясовано основні напрями впливу гейміфікації на освітнє середовище; розписано шість кроків ігрових механізмів з упровадження гейміфікації в освітній простір; показано значущість впровадження, негативні прояви гейміфікації для освітнього процесу та розкрито основні аспекти гейміфікації. Виписано найдієвіші особливості гейміфікації для

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effective features of gamification for students of higher education are listed and examples of Internet projects using gamification in the educational space are given. The introduction of gamification methods through the use of models is substantiated. An experimental study was conducted to check the formation of professional competence in future specialists by providing an educational gamified system in higher education institutions.

Keywords: gamification, professional competence, education, gamified system in institutions of higher education, students of higher education.

здобувачів вищої освіти та наведено приклади проектів у мережі Internet із використанням в освітньому просторі гейміфікації. Обгрунтовано впровадження методів гейміфікації шляхом використання моделей. Проведено експериментальне дослідження з метою перевірки сформованості професійної компетентності у майбутніх фахівців шляхом забезпечення освітньої гейміфікованої системи у закладах вищої освіти.
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Ключові слова: гейміфікація, професійна компетентність, освіта, гейміфікована система у закладах вищої освіти, здобувачі вищої освіти.

Introduction

Nowadays, gamification has a significant impact on the life of every person. From the screen of a laptop, smartphone, or computer, we are constantly and continuously affected by a huge flow of information that can be modified and this allows us to use game elements as a potential incentive for the self-development of each individual. The market of gamified technologies is actively developing all over the world, thereby attracting a new audience to education and self-education. In institutions of higher education, game technologies are actively implemented, making the educational process interesting and effective in the work of students of higher education. With the help of gamification, personal motivation becomes the most effective way of interaction for each person, in particular, and large corporations, in general. The higher education system is actively moving to a training model from an academic lecture model (Trishchuk et al., 2019).

At the heart of gamification is the idea of using a game approach to make teaching and learning more interesting and effective.

The real value of gamification is that the game principle contributes to the creation of a meaningful learning experience, which is necessary for the training of a competent specialist.

The abundance of computer equipment and the availability of high-speed access to the global Internet network made it possible to widely use digital didactic tools, global information resources, and educational Internet services in the educational process, which created conditions for improving the educational process and increasing its quality and effectiveness. However, the realities testify to the lack of a proper return from the technical modernization of educational institutions: in mass pedagogical practice, the predominant use of traditional methods is observed; the pace and level of mastering of the latest pedagogical tools by teachers do not meet the requirements of a modern digital school; the educational process is not adapted to the needs and expectations of modern students who live in the world of the Internet and gadgets.

The determining factor in solving the outlined problem is the improvement of the system of professional training of personnel in the direction of ensuring their ability to creatively and productively use the powerful educational potential of innovative digital technologies. From the point of view of the training of specialists, the possession of modern technologies comes to the fore.

In the modern educational situation, there are several contradictions between:

– the growing influence of information resources on the development of education and the lag of theoretical and methodical research on their systematic use in the educational process;
– the significant didactic potential of the informational educational environment and the lack of theoretically grounded models and effective methods of using gamification in educational institutions;
– the growing demands of society for the organization of the educational process and the low level of use of ICT tools;
– the presence of a significant amount of software, teaching-methodical and didactic support for the educational process, and the lack of universal access to it;
– the significant technological potential of the informational educational environment and the low educational mobility of participants in the educational process;

- intensive development of ICT and the speed of updating the content of educational programs, which ensure the formation of IC competence for educational communication, cooperation, cooperative work.

In the article, we considered: the content of the terminological apparatus of gamification; the main directions of influence and structural elements of gamification; six steps of game mechanisms for introducing gamification into the educational space; the importance of implementation, negative manifestations of gamification for the educational process and the main aspects of gamification; the most effective features of gamification for students of higher education; examples of Internet projects using gamification in the educational space; introduction of gamification methods through the use of models; experimental verification of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education.

However, despite a significant amount of research, the problem of using gamification in the educational process of a higher school has not yet been fully explored, further research is needed to provide theoretical and practical support for the implementation of the technology and its application methods. The insufficient development of aspects of this problem, and its relevance determined the choice of the topic of the article.

Literature review

In recent years, interest in education has increased significantly, and teachers increasingly turn to the services of the Internet to use ICT for communication, cooperation, and work organization, and the rapid development of Internet resources, in particular gamification, has become a leading trend in solving the problems of educational mobility of all participants of the educational process.

The psychological-pedagogical analysis of the research made it possible to analyze and show the advantages of the gamification process in the professional development of students of higher education of various specialties, to reveal its role in the educational environment of higher education institutions. In particular, O. Trischuk, N. Fihol, & N. Volyk (2019) structured the stages of gamification development; revealed gamification as a scientific term, as a social and cultural phenomenon; developed a method of analyzing the effectiveness of gamified materials; proposed criteria for the uniqueness of gamification tools. O. Karabin (2019) also presented gamification as a social and cultural phenomenon. The need to implement the hemification process in education to form professional competencies and practical skills is shown; formation of positive motivation to consolidate and master new professional material; the inherent influence of game technologies on the educational process of education seekers; awakening a sense of self-sufficiency of the individual, forming creative thinking, improving his mental abilities, mastering the skills of the cognitive process, developing critical thinking skills. In the form of a pyramid by levels, the scientist considered the structural elements of gamification and identified the main components of game activity at various stages of educational activity, characterized game mechanisms, and showed their content.

Scientists emphasize that the introduction of ICT into the educational process and its digitalization allows to implementation of a new format of education. Gamification is considered by modern scientists as a component of the educational environment and acts as a complex, multifaceted entity. At the same time, the analysis of scientific sources on the topic of the study proved the absence of works devoted to the comprehensive study of the problems of the organization of the information environment, in particular its organizational mechanisms, as well as the involvement of pedagogical workers of educational institutions in the processes of ensuring the quality of the training of specialists using the capabilities of the information environment.

As an innovative and promising means of increasing the foreign language competence of higher education students, the study of the gamification process during independent, remote, classroom work by O. Pasichnyk (2018) is presented. To create interactive quests, professionally oriented games, and quizzes based on educational platforms, the possibilities of integrating such various educational platforms in the educational process of a higher school were considered.

O. Zhernovnykova et al., (2020) devoted their research to the formation of digital competence of future teachers using gamification. The researchers revealed the essence of the concepts of "digital competence", "digital training of the future teacher", and "gamification of education". It has been proven that the formation of digital competence of future specialists using gamification is one of the factors that contribute to the effective development of the entire educational process in a modern institution of higher education since gamification in education is a new ideology based on the "digitalization" of education, in which coordinators of educational trajectories and online platforms replace traditional teachers. The authors developed and theoretically substantiated the technology of forming the digital competence of future specialists using gamification, while the following mobile applications were chosen: ClassDojo, DuoLingo, Brainscape, Coursera, and Socrative.

The didactic properties of the use of electronic educational resources in general educational institutions are summarized by M. Imeridze, I. Bykov, & D. Velychko (2020). They analyzed the process of gamification in the professional development of students of various undergraduate majors, which are innovations in the process of professional development of students. The importance of computer games has been proven, which allows for the creation of new educational practices; new forms of professional training and education are proposed. Gamification is presented as "the application of game elements and game principles in non-game contexts to achieve real educational goals while studying an educational subject".

With the continuous development of ICT comes opportunities for widespread access to electronic educational resources, which is an urgent issue for domestic general educational institutions, but this problem is not fully disclosed in scientific works.

Many foreign scientists pay attention to the need to explore gamification in the educational process. In particular, V. Malvasi & D. Recio-Moreno (2022) emphasize that gamification is projected as a challenge for innovation in the educational context. In recent years, game-based learning proposals have been developed to facilitate the learning of the learning content of the subjects. This study aims to diagnose the level of application of gamification as a learning strategy in the field of mathematics based on the perception of secondary school teachers and students. In turn, the authors K.Werbach & D. Hunter (2015) note that gamification is one of the effective ways to solve the problem in education. However, there is still a lack of systematic understanding and effective use of gamification due to the diversity of gamification functions. More importantly, most gamification feature classification methods fail to provide practice guidance. In their study, a new model (SMART) was proposed for the classification of gamification functions.

So, our psychological and pedagogical analysis of research showed that gamification is a process that contributes to the transformation of the educational process into a game and ensures the use of the dynamics of games and game thinking to attract students of higher education to solve educational tasks. Research shows that one of the main methods of organizing education is gamification. At the same time, the analysis of scientific research on the specified problem provides grounds for asserting that gamification in the educational process of higher education institutions was not the subject of detailed scientific research.

It should be noted that despite the presence of a large number of sources that consider the theoretical and practical aspects of the use of gamification in the educational process, their use remains limited, which is caused, first of all, by the lack of proper preparation of teachers for such activities in psychological, pedagogical, methodological and technological aspects. At the same time, there is a lack of research focused on the highlighted entities, the theoretical and methodological foundations of training specialists to use gamification technologies in the educational process, and the issues of didactic and methodological support for the said training remain problematic.

According to this purpose of the study is a need to implement and study the most effective ways of introducing gamification into the educational process of higher education institutions to prepare a competitive young generation. To conduct an experimental study to check the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education.

Methodology

The methodological concept reflects the relationship and interaction of the use of gamification methods in the educational process of higher education institutions, in particular the use of various components (motivational, meaningful, activity, and reflective components). In the process of the conducted research, a set of methods was used to ensure the achievement of the goal, namely: theoretical: conducting a systematic analysis of research and scientific literature to clarify the different approaches of scientists to the concept of gamification in the educational process of higher education institutions, comparing different views on the problem under study, analysis of works on improving the organization of the educational process, analyzing the training of future specialists and researching pedagogical experience; empirical: application of methods: conversations, observations, surveys, questionnaires to find out the features of the gamification of the educational process of universities in the process of professional training of specialists; conducting a pedagogical experiment to collect data on the effectiveness of gamification in the educational process of universities; experimental research base: experimental research was conducted during 2022-2023. A total of 86 students from higher education institutions took part in the experiment (45 in the control group and 41 in the experimental group).

Optimal research methods were chosen based on such factors as the field of science, the availability of raw data for analysis, and the amount of material.

The research is quantitative. The purpose of this is to measure and analyze numerical data to test effective pathways, identify patterns, and make predictions. Our research includes an experiment.

The implementation of the pedagogical experiment was carried out in three stages: preparatory, main, and final.

At the preparatory stage, the purpose and tasks of the research were determined, the experimental plan was developed, methods of measurement and processing of results were selected, control and experimental groups were selected, and their homogeneity was checked.

At the main stage, an experiment was conducted. At the final stage, the results of the experiment were analyzed, their reliability was confirmed, and conclusions were drawn about the pedagogical effect of the experiment. The experiment was conducted at several universities: A.S. Makarenko Sumy State Pedagogical University, and Khmelnytskyi Humanitarian-Pedagogical Academy. Permission to experiment was approved by the academic councils of these universities and considered by the ethics.

The reliability and validity of the obtained results, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The total sample size was 86 subjects. When forming the sample, the criteria of meaningfulness, representativeness, and equivalence were taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The results of the experimental study confirmed the applicability, optimality, and effectiveness of the proposed pedagogical conditions for the formation of an environmental culture of an ecologist in the process of professional training.
We conducted an experimental study to check the formation of professional competence in future specialists by providing an educational gamified system in higher education institutions, which ensures interest in professional activity, stimulates the creative expression of a specialist in professional activity, and directs his need to acquire competitive knowledge.

Results and discussion

1. **Content of the terminological apparatus of gamification.**

The term "gamification" was coined by the British video game developer Nick Pelling, who used it in his own development in 2002. At the same time, the inclusion of game elements in educational technologies in Western institutions of higher education gained wide popularity in 2010 and began in 2008. At this time, gamification has spread in professional activity, the education system, in all spheres of human life.

Gamification is considered a process of using the dynamics of games, game thinking to transform the educational process into a game, the introduction of game techniques, games, game practices with an educational purpose, the involvement of students of higher education in solving tasks, the activation of educational activities throughout life (Karabin, 2019); this is the effective use of individual game elements in non-game situations when game elements are involved in real circumstances to motivate participants in the educational process for behavioral reactions or certain actions. The focus of process participants on a real goal distinguishes gamification from other game forms. With this approach, gamification is related to one's own activity, and the success of this method lies in the power of motivation for the educational space and learning (López Marí et al., 2022).

2. Main directions of influence and structural elements of gamification.

The phenomenon of gamification is inextricably linked to the field of education, today it is actively used in many areas of human activity, where it demonstrates its effectiveness as best as possible (Malvasi & Recio-Moreno, 2022).

Let's find out the main areas of influence of gamification on the educational environment:

1) psychology of decision-making;
2) implementation of motivational solutions;
3) further behavioral results (Trishchuk et al., 2019).

We will consider the structural elements of gamification at the following levels: principles of work (interaction, expectation of victory, feedback, and competition with game participants); gamification components (badges, awards, symbols, etc.); game dynamics (relationships between game participants, player progress, emotions).

Elements of gamification can be applied at various stages of educational activity: a complete lesson; multiple use; and structural elements of the lesson.

Allowance for mistakes is a great feature of gamification. Therefore, with such an approach, students feel free, they are not afraid of punishment and condemnation for mistakes, their fear of wrong actions disappears and fear is replaced by confidence and initiative. This allows higher education students to independently choose options for action in the educational process. This forms a sense of responsibility for their own actions and encourages them to be active.

3. Six steps of game mechanisms for introducing gamification into the educational space.

To successfully implement gamification, it is worth using the instructions for building a game system by the main experts in the field of gamification, Kevin Werbach and Dan Hunter, who developed six steps of game mechanisms for introducing gamification into the educational space.

Step 1: Setting gamification goals. Goals should correspond to the acronym SMART (Specific Measurable Achievable Relevant Time-bound) and should be: relevant; achievable; measurable; specific; and time-bound. Gamification tasks should, according to each element of the system, be guided by the set goals and contain the specified characteristics.

Step 2: target determination of the behavior of those seeking higher education. For each of the participants of the gamification system, the behavior should be thought out. To further design the system, it is necessary to describe all the chains of actions of each of the players (students of higher education). At this stage, it is worth giving answers to the following questions: How does such an approach in education contribute to the achievement of the set goal? What should players (graduates) do? How does feedback work? How do we measure it?

Step 3: Perform the description of players (higher education students). The images of players (students of higher education) must be clearly defined. At each of the stages, it is mandatory to define the description of different types of players (students of higher education), with a well-thought-out motivation for performing their actions.

Step 4: development of structural elements of the gamification system. The structure of the game system has the following levels (according to K. Werbach & D. Hunter (2015)):

– micro-level – "cycles of involvement in the educational space". These are "motivation to action – action – feedback" chains. Performing an action, motivating the player (higher education student) to act, receiving feedback from the system (rewards, etc., which is the system's reaction to the higher education student's actions). At the feedback stage, students of higher education are encouraged to take the next action (calls to

action, motivation management techniques, etc.);
- macro-level – “the player’s journey to gain new knowledge”, this is the phasing of tasks according to a pre-developed scenario; presenting an exciting story on which the gamification system is based.

Step 5: Provide players (students of higher education) with a sense of success and satisfaction with the implementation of gamification mechanisms. Gaming activities of students of higher education should bring pleasure and a sense of joy. The game process itself should be fun, and a pleasant activity (Vergara et al., 2023).

Step 6: selection of tools by students of higher education. The use of information technologies for the game system, the implementation of the gamification process by using electronic and digital devices, gadgets, cloud technologies, and mobile applications prepared at the previous stages of the educational process (Liashenko, 2017).

4. Significance of implementation, negative manifestations of gamification for the educational process, and main aspects of gamification.

Implementation of gamification:

- develops mental skills of students of higher education, promotes students' motivation for the educational process in a higher education institution;
- develops a person's spatial imagination and reaction to the promotion of new material;
- encourages students of higher education to work in an interactive environment;
- promotes the organization of independent work of students of higher education;
- forms practical work skills and abilities of students in groups with consolidation of educational material, etc.

We note the shortcomings of the implementation of gamification in the educational process, in particular:

- imperfect implementation of game techniques;
- misunderstanding of the tasks and goals of the educational process;
- the presence of a deficit in communication during the educational process;
- improvement of training of teachers in the use of tools and information technologies;
- the presence of time costs associated with the implementation and development of gaming activities (Karabin, 2019).

Let's name the main aspects of gamification:

1) dynamics – the use of scenarios to focus the user's attention and his reaction in real time;
2) mechanics – the use of scenario elements that are characteristic of the game process (status, virtual awards, virtual goods, points);
3) aesthetics – to promote emotional torture, creating a general gaming impression;
4) social interaction – a wide range of techniques that provide interaction between users (Sergeieva, 2014).

5. The most effective features of gamification for students of higher education.

Considering the impact of game methods in education, let's highlight the most effective features for students of higher education:

- quick, unlike traditional, feedback (higher education graduates immediately make the next decision, because they see the consequences of their actions);
- clear rules for achieving goals (the conditions for obtaining the required result in traditional education may change depending on the circumstances, be dynamic, and during gamification, such algorithms are used (they must be clear and unchanging), which are processed by computer technology);
- the plot of the game (attracting higher education students to a certain plot line, certain activities within the framework of a common goal, creates the effect of penetration, involvement in exactly such a story, which is played by the character);
- challenging tasks (those that can be solved, unlike life difficulties, but are sufficiently complex and divided into small, step-by-step, global tasks, which helps create a situation of success and increases interest in learning);
- the complication of tasks and goals, expansion and opening of access to educational content, and gradual change as students of higher education acquire new competencies of skills, manifested in the change of levels, obtaining points (obtaining a digital indication of the significance of the work done);

– conditional infinity of the game (the game continues until the player (student of higher education) becomes an expert.

Games used for educational purposes can be MMORPG (massively multiplayer online role-playing game) – online role-playing games with a large number of users; games alternative reality games (Alternative Reality Games) – an interactive story that uses game elements, objects of the real world; pervasive games (Pervasive games) – games where there is no clear boundary between the virtual fictional world and reality. When introducing games into educational activities applicants for higher education, the following points must be taken into account: there must be a rating system for each new level, a task (learning module), and a point system, each type of activity must be evaluated, and the evaluation system must start from 0; games can be influenced by outsiders and take place in the real world, that is, depending on the circumstances, certain conditions may be changed; human behavior is unpredictable, it cannot be programmed.

6. Examples of Internet projects using gamification in the educational space.

Today, there are many projects on the Internet using gamification in the educational space. Here are some examples:

– *Codecademy* – teaching programming in HTML, JavaScript, Ruby, Python (https://www.codecademy.com/);
– *Motion Math Games* – mobile math games make learning fun and make education exciting (https://motionmathgames.com/);
– *Code School* – a service with gamification elements for teaching programming (https://www.codeschool.com/courses);
– *Khanacademy* – free video courses on various subjects (https://www.khanacademy.org/);
– *Mathletics* – a program for the educational space of school education, aimed at strengthening mathematical skills through tasks and games that are difficult to complete (https://www.mathletics.eu/);
– *Foldit* – solving scientific tasks as puzzles (https://fold.it/portal/);
– *Spongelab* – an innovative platform for personalized scientific education (https://www.spongelab.com/);
– *Physicsgames* – interesting scientific games that require knowledge of physics (http://www.physicsgames.net/) (Bondarenko, 2017).

Video games and computer games, which are the basis of gamification, differ from other popular media because they are interactive and allow players (students of higher education) to act in different roles (inventor, scientist, political leader, traveler, etc.), to make choices and evaluate its consequences, set tasks (Pasichnyk, 2018).

Gamification is closer to traditional games than conventional educational games. Video games that are used to gamify the educational space of higher education are more complex than educational games. Educational games may not be included in gamified education at all.

The ClassCraft system is an example of a gamification tool – it is a free educational role-playing game in which the student and the teacher play during the educational process. It can be included in the teaching of any discipline, is the foundation and background for the game-based educational process, and is used to motivate students to education and interest them in the educational process of higher education. The real success of the student of higher education is reflected by the rewards and achievements received during the game. Performance analytics is integrated into the gamification system, which allows parents to receive information on the success of students. This system also encourages higher education seekers to cooperate, because it is they who help each other during the game and this allows getting additional points that add up to the overall score of those who actively help other education seekers (Arufe Giráldez et al., 2022).

Therefore, the ClassCraft system is flexible, individualizes the educational process, provides an accessible educational level for each student, encourages active cooperation, and allows you to spend less time tracking success. The difference from educational games of the ClassCraft system is that it does not just present educational material in a game form, but acts as a game basis for interaction between a student and a teacher, allowing to transform educational material into a game.

Game-Based Learning (GBL) is a form of education that is used to add entertainment to the educational process and to motivate learners to learn through the game to make learning more interesting. The involvement of video games in the educational process in a higher education institution occurs as an element of reward for the achieved educational result, as a simulation, as an educational example. The goal of GBL is to turn the entire educational process into a game. This goal coincides with the goal of gamification, that is, the use of a video game as part of the educational process of a higher education institution. The common features are that both of these directions can successfully test certain models, test identities and roles in the game process, transfer values and information; and appeal to the emotions of the player (student of higher education), thanks to which the interaction is often more effective than a simple exchange of information; practicing skills in the game, similar to practicing them during training (Durmaz et al., 2022).

Using in education based on the game Minecraft: Education Edition. This is a version of the popular Minecraft game adapted specifically for the educational process and can be used for a better understanding of educational material, not just for fun. It is a kind of compromise between rewards for higher education achievers, full gamification of education, and educational games. Unfortunately, the transformation of the educational process into a video game and the use of video games in education has not gained significant popularity. We agree with the opinion of G. Frasca (2015), who notes that "games do not change the educational system as long as it is concerned with the fear of parents and the administration, and not with the needs of children.". For the full inclusion of games in the educational process and the application of the educational potential of video games in the educational space, not only technical tools should be used. An important direction is to work with educators and parents, who do not always see video games as an innovative and important tool for quality education (Horban, 2019).

7. Implementation of gamification methods through the use of models.

In the educational space of higher education institutions, it is necessary to introduce gamification methods, this can be done by using the following models:

– within the framework of the mixed learning model, the use of an educational gamified system (Lingualeo, Codecademy) as a useful application;
– use of game elements, embedding them in the LMS;
– creation of an educational gamified system by students of higher education (the game "ARTé:Mecenas", developed by employees and students of higher education at Texas A&M University, which makes it possible to follow, for example, the influence of art on the development of the Italian economy in the Renaissance era, acting on behalf of the Medici family) ;
– adding game elements to the educational process of the higher school, leveling out, compared to the gamified system, the negative signs of the traditional educational system.

The choice of game technologies is an additional useful component that should be used in education and is not an alternative to the academic style of presentation of educational material.

It is important, and necessary to simplify educational processes with game elements according to the principle formulated by A. Einstein: "Everything should be simplified as long as possible, but no more" (Kravets, 2017).

8. Experimental verification of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education.

We believe that the creation of an educational gamified system in institutions of higher education will ensure the formation of professional competence in future specialists, the components of which are motivational, meaningful, active, and reflective components (Zhernovnykova et al., 2020).

The motivational component of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education stimulates the creative expression of personality in professional activity and is characterized by the purpose, motives, and needs in the professional educational process using gamification, assumes the presence of interest in professional activity, directs the need of future specialists to our acquisition of professional knowledge (Magadán-Díaz et al., 2022).

The content component of the formation of professional competence in future specialists through the provision of an educational gamified system is determined by the depth, completeness, and systematicity of the knowledge of the future specialist and in his future professional activity ensures the free introduction of gamification tools that affect the formation of professional competence, etc.

The activity component in the educational process of a higher education institution contributes to the introduction of gamification tools aimed at forming the development and knowledge of professional competence, creativity, and self-improvement (Abad Escalante et al., 2022).

The reflexive component of the formation of professional competence in future specialists through the provision of an educational gamified system is determined by the attitude of higher education students to their practical activities, to the world, and to themselves. Its components are self-esteem, self-awareness, understanding of one's own importance in the team and self-control, responsibility for the results of one's activities, understanding of the results of one's activities, self-realization, and self-knowledge in professional activity using gamification.
Properties interconnect each component and act as a part of a holistic system of formation of professional competence of future specialists (Plakhotnik et al., 2023).

The study determined the criteria and indicators of the formation of professional competence in future specialists by providing an educational gamified system:

- motivational (ensures the presence of motivation for gamification in education, interest in using gamification tools, and awareness of the purpose of professional activity);
- personal-reflective (reflective analysis, use of knowledge in non-standard situations, correction of professional activity);
- cognitive and informational (a set of knowledge about the legal framework and means of obtaining information, about methods and methods of working with information; knowledge of mechanisms for the development of gamification tools);
- activity (skills and ability to use gamification tools).

It should be noted that the survey of higher education applicants and their questionnaire testified mainly to the average and low level of formation of professional competence in future specialists by providing an educational gamified system at the ascertainment stage of the experiment.

Taking into account the content of the components of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education and the entire logic of the process of professional training of students of higher education, the technology of its implementation was substantiated.

The experimental stage of the technology for the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education provided students with the formation of a professional focus on the use of gamification tools in future professional activities. The educational gamified system in institutions of higher education consists of a complex of value attitudes, formed motives, associated with the desire to improve one's training, with an active positive interest in gamification tools, enthusiasm for this type of activity, which involves the use of incentives for the successful implementation of the planned.

According to the developed criteria, with the help of a set of measurement procedures, at the control stage during the experiment, the level of formation of professional competence among future specialists was monitored by providing an educational gamified system in higher education institutions. The motivational stage of the developed technology for the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education was evaluated according to the motivational criterion.

The motivational criterion of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education was checked using a questionnaire. Those seeking higher education were asked to determine the expediency of working with gamification tools in their future professional activities and to evaluate the importance of the proposed motives on a 3-point scale: to improve knowledge; gain professional authority from teachers and colleagues; to motivate one's educational activities during practice; be able to transfer your knowledge to other colleagues; get pleasure from creating didactic video games; successfully pass tests, exams; to gain experience during life for further professional activity; use the Class Dojo mobile application in professional activities; be able to create a professional electronic magazine; self-improvement.

The results of the ascertainment and control stages of the experimental verification of the motivational criterion of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education provide grounds for asserting that higher education applicants of the experimental group (EG) compared to the respondents of the control group (CG) had a significantly higher level of indicator "Motivation for gamification in education".

The increase in EG is +68.0, and in CG the increase is only 7.3.

As a positive, we note the low level of the indicator "Understanding the possibilities of using gamification tools in the educational process." It decreased to 33.2% from 81.1% among EG respondents, and to 52.4% from 82.9% among CG respondents.

We believe that the creation of an educational gamified system in institutions of higher education will ensure the formation of professional competence in future specialists. Therefore, we conducted an experimental study to check the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education, which ensures interest in professional activity, stimulates the creative expression of a specialist in professional activity, and directs his need to acquire competitive knowledge.

In the course of the research, a set of methods was used to ensure the achievement of the goal, namely: theoretical, empirical, and statistical.

Optimal research methods were chosen based on such factors as the field of science, the availability of raw data for analysis, and the amount of material.

The experimental study was conducted during 2022-2023. A total of 86 higher education students participated in the experiment (45 in the control group and 41 in the experimental group). To compare the results in the control and experimental groups, control sections were conducted simultaneously, the goal was for the experimental group – to check the influence of the system of formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education, and in the control group – to check the formation of professional competence of future specialists in the process of training according to the traditional system.

We performed the most important function – control of variables – as part of the validation of the experiment. Special attention was paid to the conceptual area, which refers to the issue of validity control as the basic activity of the experimenter. Validity was defined as the degree of correspondence of the measured variable to the studied property of a real object using an experiment. As the optimal way to increase the validity of the experiment, we chose the preliminary planning of the system of formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education. The design of the experimental procedure will ensure the success of the application of the experimental method in our research.

Validity was assessed using the following criteria:

– physiological – skills, knowledge, comfort, complexity, atmosphere;
– subjective – personal attitude of respondents to specific conditions, and tasks of the experiment;
– performance criteria – acquired skills, volume of performed tasks, time spent;
– accident criteria caused by circumstances in the course of experimental scientific activity and unforeseen factors.

There was a phenomenon of mutual interference in validity because it was the validity that arose as a result of the simultaneous impact on the same object being studied (testing the influence of the system of formation of professional competence in future specialists by providing an educational gamified system in higher education institutions), several groups of methods were involved. Therefore, it is not just the number of methods that are important for the research process, but their competent selection and their quality.

The reliability and effectiveness of empirical research results depend on the optimally developed organizational system for the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education.

After re-diagnosing the level of formation of professional competence among future specialists by providing an educational gamified system in institutions of higher education, we have the following results, which are presented in Figure 1.

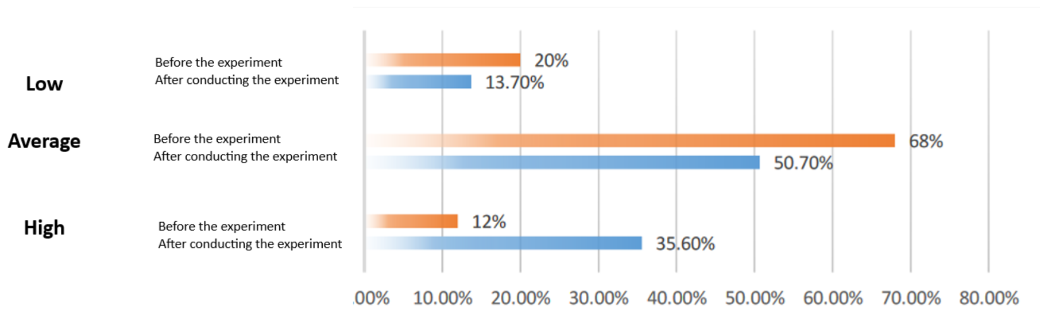

Fig. 1. The results of the comparative analysis of the conducted experiment.

Thus, comparing the results of the data with the initial level of the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education, we can say that in the experimental group, the indicator increased after the application of the work system for the formation of professional competence in future specialists by providing an educational gamified system in institutions of higher education. In the control group, the number of respondents with a high level of formation of end-to-end skills of professional competence in future specialists by providing an educational gamified system in higher education institutions increased by 23.6%, with an average level, the number of respondents decreased by 17.3%, and the number of respondents decreased with a low level by 6.3%.

The data obtained during the control stage testify to the plausibility of the proposed hypothesis and the effectiveness of the developed work system, which contributes to the formation of professional competence in future specialists by providing an educational gamified system in higher education institutions. Therefore, the system of work, which involves the formation of professional competence through the introduction of gamification tools, its key elements, can be used in higher education institutions, as it contributes to the deepening of knowledge in the field of modern education. It can be claimed that we have developed a system for working with gamification in institutions of higher education and it is effective because, in the experimental group, the results of its implementation among the respondents of the experimental group showed positive dynamics.

Conclusions

The content of the terminological apparatus of gamification is theoretically revealed; the main directions of influence and structural elements of gamification are shown; the main areas of influence of gamification on the educational environment are clarified; six steps of game mechanisms for introducing gamification into the educational space are described; the importance of implementation, negative manifestations of gamification for the educational process are shown, and the main aspects of gamification are revealed.

The most effective features of gamification for students of higher education are listed and examples of Internet projects using gamification in the educational space are given.

Such games are described, which differ from other popular media and are the basis of gamification, are interactive (ClassCraft System, Game Based Learning (GBL), and used in education based on the game Minecraft: Education Edition).

The introduction of gamification methods through the use of models is substantiated.

An experimental study was conducted to check the formation of professional competence in future specialists by providing an educational gamified system in higher education institutions, which ensures interest in professional activity, stimulates the creative expression of a specialist in professional activity, and directs his need to acquire competitive knowledge.

Consideration of Internet projects with the use of gamification in the educational space requires further research.

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Investigation of criminal offenses in the field of tourism through technical means

Розслідування кримінальних правопорушень у сфері туризму за допомогою технічних засобів

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Abstract

Tourists are frequent victims of criminal offences, but the investigation of such crimes is usually complicated by several factors, which allow offenders to often stay unpunished. The aim of the research is to study the possibilities of using technical equipment during detection, investigation, and prevention of crimes against tourists. The research employed a doctrinal approach, a statistical method and other methods. The study identified the factors of victimization of tourists and the main scenarios under which crimes are committed. The main areas of application of technical equipment for the detection and investigation of crimes in tourism are established: the use of photo and video recording devices, traceology, weapons examination, handwriting examination, document, examination, identification of a

Анотація

Туристи є частими жертвами кримінальних правопорушень, проте розслідування подібних злочинів зазвичай ускладнене рядом факторів, через які злочинці нерідко залишаються безкарними. Це актуалізує тему дослідження можливостей використання технічних засобів для виявлення та розслідування кримінальних злочинів в сфері туризму. Метою роботи є дослідження можливостей використання технічних засобів у ході виявлення, розслідування, а також попередження злочинів проти туристів. У ході дослідження було використано формально-юридичний метод, статистичний метод та ін. В результаті роботи було виявлено фактори віктимізації туристів та основні сценарії, за якими відбуваються злочини. Так, туристи часто є легкою мішенню через необережність, небажання повідомляти

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person by appearance, phonoscopy, odourology, research of physical evidence, forensics, forensic profiling, etc. The problems of using technical equipment to detect and investigate crimes in the tourism sector are identified using the example of Ukraine, particularly the impossibility of using interrogation video footage as evidence during a judicial investigation. The obtained conclusions can be useful for optimizing the work of law enforcement agencies by providing a wide range of modern innovations to increase the effectiveness of detection and investigation of crimes in tourism.

Keywords: technical equipment, criminal offences, tourism sphere, innovations, digitalization, victimization of tourists.

про злочини у правоохоронні органи, а також тимчасове перебування на території країни, що ускладнює розслідування. Розкрито основні сфери застосування технічних засобів для виявлення та розслідування кримінальних злочинів в сфері туризму: використання фото- та відеозаписуючих засобів, трасологія, дослідження зброї, дослідження почерку, дослідження документів, ідентифікація особи за зовнішністю, фоноскопія, одорологія, дослідження матеріальних свідчень, криміналістична форензіка, криміналістичний профайлінг та ін. На прикладі України розкрито проблеми використання технічних засобів для виявлення та розслідування злочинів в туристичній сфері, зокрема неможливість використання відеоматеріалів допиту як доказу під час судового розслідування. Отримані висновки можуть бути корисними для оптимізації роботи правоохоронних органів через надання широкого спектру сучасних інновацій для підвищення ефективності виявлення та розслідування злочинів в туризмі.

Ключові слова: технічні засоби, кримінальні злочини, туристична сфера, інновації, цифровізація, віктимізація туристів.

Introduction

Crimes against tourists are very common and threaten both the safety of people and property, as well as the development of the tourism sector due to damage to the image of certain tourist destinations (Glensor & Peak, 2004). This necessitates the study of modern technical equipment that can be useful for detecting and solving crimes against tourists.

Detection and investigation of crimes in tourism is often complicated by several factors. These are the distance and differences in the legislative framework between the countries where tourists live and where a crime has been committed against them, the tourists' reluctance to report crimes to law enforcement agencies, as well as other difficulties characteristic of all areas and related to the challenge of identifying traces of crimes and adapting the criminal areas to traditional methods of investigation.

In view of the foregoing, the means of detecting and investigating crimes need to be modernized (Humin et al., 2018) through the exchange of best practices. Technical equipment helps to increase the level of crime detection several times (Nikkel, 2020; Završnik, 2020; 2021). Technological innovations enable more effective detection and investigation of crimes in tourism by detecting and analysing traces that are difficult or impossible to detect with conventional methods (Win et al., 2020). Moreover, they can prevent crime and provide greater safety for tourists (Brayne & Christin, 2021; Mambetova et al., 2021). Digital technologies are already widely used in the field of tourism (Arefiev et al., 2024; Pikkemaat et al., 2019; Stankov & Gretzel, 2020), ensuring a higher level of security for tourists. In the event of a crime, such tools as video surveillance cameras, identification by fingerprint or license plate number can provide useful information during the investigation. Specialized technical equipment is being developed, which are used by law enforcement agencies to identify the criminal, the victim, reveal details of the crime, etc., based on the smallest traces of materials, DNA, invisible prints, etc.

The aim of the work is to study the possibilities of using technical equipment in the course of detection, investigation, and prevention of crimes against tourists. The aim involves the fulfilment of the following research objectives:

- identify the most widespread types of crimes in tourism and the factors of victimization of tourists;
- describe the technical equipment of detecting crimes in tourism;
- conduct an overview of the analytical SMART functions of CCTV cameras and their use for the investigation/detection of crimes in tourism.

In accordance with the tasks, the first section of the study reveals the factors of victimization of tourists, as well as the main scenarios under which crimes are committed. At this stage of the research, the relationship between the number of international tourists and the level of crime in the most popular tourist destinations in Europe was revealed by conducting a correlation analysis. The second section of the study is devoted to the characteristics of effective technical means that come in handy in the process of investigating crimes in the field of tourism. The third section outlines an approach to improving the investigation of tourism crimes using video surveillance. At this stage, the intelligent functions of modern video surveillance cameras are described and ways of their application in the investigation process are proposed.

Literature review

Many researchers study the possibilities of using technical equipment in forensics. The issue of crimes in tourism, the use of innovations in the tourism sector is also covered. Along with this, the problem of detection and investigation of crimes in tourism with the use of technical equipment is not sufficiently studied, and most works focus only on certain aspects of this field of research.

Buhalis (2020) studies the possibilities of using technological innovations in tourism. The researcher notes both the positive aspects of innovations in this field and their dangers. At the same time, the paper states that new technologies allow tourists to create shared values at all stages of the trip. Pencarelli (2020) explores the concept of Tourism 4.0 or “smart tourism” and also divides the experience of using technological means in tourism into positive and negative. In particular, the researcher notes the importance of using social platforms and the possibility of accessing them through mobile devices as an important means of protecting oneself from emergency situations (terrorist attacks, riots, etc.). Hua et al. (2020) deal with criminal offences in tourism. The researchers note that the implementation of the latest security technologies in hotels can create new values for tourists, increasing their safety, and sharing impressions through digital means of communication increases awareness. At the same time, the development and introduction of new technologies threatens with new opportunities for committing crimes. Such possibilities include the risk of information leakage. Besides, security technologies may violate customer privacy. An important advantage of the mentioned studies is the identification of the dangers of using technical means to investigate crimes in the field of tourism, in particular, violations of confidentiality and cybersecurity. This emphasizes the need to strike a balance between technical advantages and ethical aspects.

Vakhitova et al. (2023) explore the relationship between tourism and crime. The researchers have revealed that tourists are more likely than locals to experience crime while on holiday, particularly theft from tourist accommodation. Researchers note that this affects the tourism industry as a whole, because crime reduces the popularity of tourist destinations, and crimes against tourists deter them from returning to the places where they occurred. Mataković and Cunjak Mataković (2019) give reasons why tourists are frequent victims of offenders. The researchers also classify crimes in the tourism sector by perpetrator, noting which objects, types and goals of crimes are the most frequent in each case. Buil-Gil and Mawby (2023) compare the willingness to report crimes by locals and tourists. The study found that international tourists are less likely to report crimes to the police than local residents. However, crimes involving vehicles are more often reported by tourists. These studies are mainly focused on the causes of the problem of crime against tourists, at the same time, they could be supplemented with a detailed description of approaches to solving this problem.

The noted research gap is filled by the work of Teplytskyi (2020), who studies the problems of investigating crimes involving computers, systems and computer networks, telecommunications networks. One of the main problems identified by the researcher is insufficient use or absence of modern technical forensic tools during investigation. The study considers the requirements for the use of such tools, as well as their various types and capabilities.

Several studies identified the procedural and legal features of the use of evidence obtained with the help of technical equipment as an evidence base. Xiao et al. (2019) study the analysis of crime evidence based on video examination. The researchers proposed their own system of forensic analysis, which will contribute to improving the quality of video material with low quality. Chaplynskyi (2022) notes that the use of technical equipment in interrogations during the investigation of criminal offences in tourism is an effective method, especially when there is a long interrogation with many details. However, the study doesn't mention legal aspects of the use of technical equipment. Venherova (2020) noted that pre-trial investigation materials (in particular, video recordings of interrogations) cannot be evidence in court under Ukrainian law. These works make an important contribution to the field under study, because without enshrining the provisions regarding technical means during investigations in the legislation, their use may be illegal and violate human rights.

The conducted literature review gives grounds to conclude that most of the works cover only separate parts of the issue under research. The specifics of the use of technical equipment to detect and investigate crimes specifically in the tourism sphere were not studied, which is a limitation of previous studies, however, provides space for new scientific research. The author of this article reveals the possibilities of technical equipment for detecting and solving crimes in the tourism sector, conducts an overview of the most effective means and ways of their use.

Methodology

Research design

The research design involves several consecutive stages. The first stage provides for the analysis of the factors of victimization of tourists, as well as the main scenarios of crimes in tourism. The second stage provides a description of the most frequently used technical equipment for the detection and investigation of crimes, as well as a description of the latest developments in this field. The third stage involves identifying the advantages of using video surveillance to detect and solve crimes in tourism. In particular, the new possibilities of modern smart functions of video surveillance cameras were revealed. The need to take into account legislative provisions regarding the possibility of using video materials as an evidence base, as well as the need to ensure confidentiality and the need to respect people's rights and freedoms, was noted at this stage.

Sample

The sample for the study includes Ukraine, which was chosen due to the high risk for tourists within the country today, which requires increased attention to the problem of investigating crimes against tourists. Also, the sample includes European countries, which were chosen based on the criterion of popularity for tourist visits, which, in turn, hypothetically contributes to the increase in the level of crime against tourists. Secondary data collected from open access resources were used for the study (Numbeo, 2023; Statista, 2023).

The work describes the best global practices of using technical equipment to detect and investigate crimes in tourism. The possibility of using video materials as an evidence base is separately covered, as well as in view of the need to ensure confidentiality and the need to observe the rights and freedoms of people using the example of Ukraine. It should be noted that today Ukraine is not one of the popular tourist destinations because of the war. According to Global Guardian (2023), Ukraine in 2023 belongs to the most dangerous countries for tourists with an extreme level of risk, along with such countries as Sudan, Yemen, Burkina Faso, and the Central African Republic. A high level of risk is characteristic of Haiti, Mexico, Venezuela, Belarus, Iraq, Ethiopia, Myanmar, Pakistan, Papua New Guinea. However, the danger according to this rating is not always related to criminal offences. In Europe, according to the Crime Index (Numbeo, 2023), Ukraine ranks only seventh in 2023 with a value of 46.8 – it is overtaken by such countries as the United Kingdom (46 ,9), Italy (47.3), Sweden (48.1), Belgium (48.9), Belarus (51.4), France (54.6).

The main limitation of the study is the lack of accurate information on crimes against tourists, which may be related, among other things, to the reluctance of tourists to report crimes, insufficient attention from government authorities to the problem.

Methods

The research employed the methods of analysis and synthesis, deduction and induction, statistical method to identify the most common factors of victimization of tourists and the main scenarios of crimes. These methods were also applied to describe the main areas of using technical equipment and high-tech innovations. Besides, the methods of analysis and synthesis were used to analyse the functions of the latest smart video surveillance cameras and reveal their suitability for use in the detection and investigation of crimes in tourism. The doctrinal approach was applied to outline the possibilities of using video materials as an evidence base, as well as in view of the need to ensure confidentiality and the need to observe the rights and freedoms of people using the example of Ukraine.

Results

Common types of crimes in tourism and factors of victimization of tourists

Crime in tourism is a common phenomenon that has different manifestations, purposes, areas of occurrence, consequences for victims, as well as legal consequences for offenders. The most common type of crime against tourists is theft, but there can also be such serious crimes as violence, rape, murder, terrorist acts, etc. In addition, crimes in the tourism sector can be committed by tourists themselves, as well as by tourist establishments in relation to visitors and criminals against tourist establishments. The study focuses primarily on crimes against tourists themselves, the high level of crime in relation to which can be explained by several factors:

– tourists often carry large amounts of money, which they can accidentally or carelessly display, or other valuables (jewellery, mobile phones, cameras, etc.), which makes them "profitable" targets;
– carelessness and inattention of tourists due to being on vacation, as well as certain excesses during sports, recreation, driving, alcohol consumption, etc.;
– tourists' reluctance to report a crime to law enforcement agencies because of the ignorance of local laws, fears about possible problems, in particular, related to returning from vacation. Besides, even if tourists report a crime to the police, they are unlikely to have the opportunity to put pressure on the police, as their stay in the country is temporarily. For the same reasons, they are most likely not to act as witnesses, so crimes may go unpunished, which encourages commitment of new crimes;
– hostile attitude of local residents towards tourists.

Offenders can easily identify tourists in a crowd because of their clothing different from locals, confusion, following a map, having a backpack/camera, etc. Most often, crimes against tourists involve the implementation of one of the following scenarios:

– a tourist is an accidental (and easy) victim who found himself in a place advantageous for criminals (for example, a crowd at the airport, public transport, etc.);
– a favourable environment for crime (places with active nightlife, various entertainment establishments, etc.);
– the tourists may find themselves in dangerous places (on their own in particular, in areas with a high level of crime, such as urban slums, or in remote areas that attract tourists with scenic nature) because of the lack of safety measures in general, risk-taking, or desire for new experiences (Glensor & Peak, 2004).

In addition, the tourists' safety also significantly depends on the safety of the hotel or other establishments where tourists stay. Poor lighting of the hotel territory, the lack of a security system, video surveillance and other security means increase the possibility of committing a crime. The crime rate in the destination country as a whole can affect the tourists' safety. For example, Figure 1 shows the relationship between the number of international tourists and the crime rate in the most popular tourist destinations in Europe.

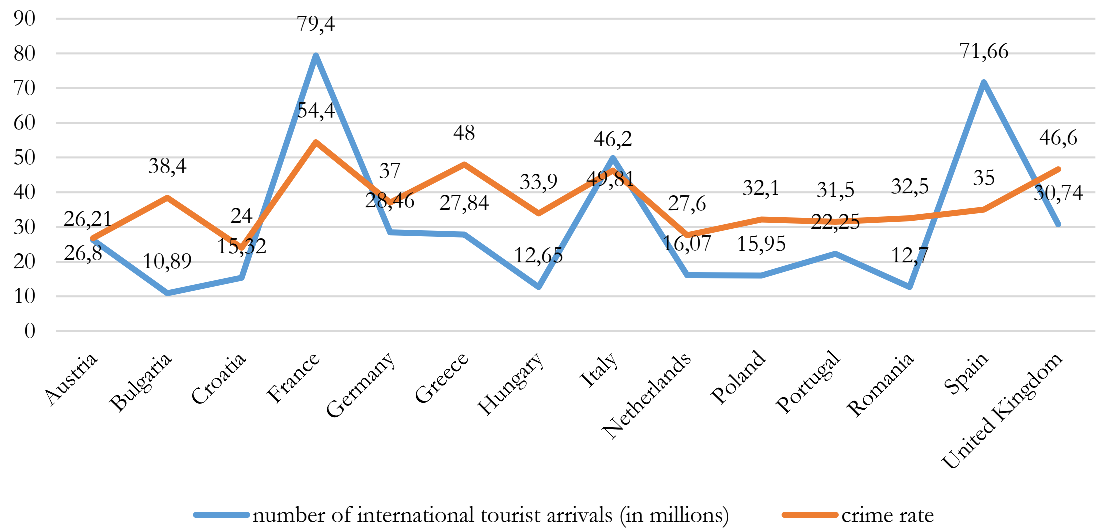

Figure 1. Correlation between the number of international tourists and the crime rate in the most popular tourist destinations in Europe in 2022 (built by the author based on Numbeo, 2023, Statista, 2023)

The correlation analysis between the indicators in Figure 1 detects a noticeable statistically significant correlation, which is approximately 0.5938. On this basis, it can be assumed that a large number of tourists can be one of the reasons for the high crime rate. At the same time, an in-depth analysis of a large sample over a long period of time is required in order to obtain more indicative results, but conducting such an analysis is beyond the scope of this research. In addition, accurate data on crime against tourists is lacking due to reluctance of tourists to report crimes, insufficient attention to the problem by the authorities, imperfect crime recording systems, etc.

Technical equipment for detection and investigation of crimes in tourism

The study of the main factors of victimization of tourists and the most frequent scenarios of crimes against them provides information for determining the most effective technical equipment for detecting and investigating crimes in tourism. The use of technical equipment (including digital ones) for the detection and investigation of crimes is aimed at obtaining information in the course of investigative activities. In forensics, there are many ways of using technical equipment, the main ones are presented in Table 1.

Table 1.
Main areas of using technical equipment in forensics

Area	Purpose
use of photo and video recording equipment	recording crimes with the use of these means makes it possible to identify the details of the crime and the criminal's identity
study of traces left at the scene of the crime (traceology)	enables identifying and collecting various types of traces left at the scene and to investigate them with the help of technical equipment
weapons examination	helps to understand the construction and methods of use of various types of weapons, including explosives, to use this information to prevent and investigate crimes
handwriting examination	makes it possible to determine the author of the text, signature, etc., based on the features of writing
document examination	used to investigate whether a document is forged
identification of a person by appearance	provides for the use of technical equipment to search for individuals based on individual external characteristics
study of sound evidence (phonoscopy), smell (odourology), materials, etc	Involves the use of technical equipment to investigate traces in the relevant directions

Without technical equipment, it would be much more difficult or impossible to obtain information in the indicated areas, which would significantly reduce crime detection rates. In addition to the mentioned areas, such innovative areas as forensics, which involves the use of computer tools to detect and investigate crimes in the digital sphere, as well as forensic profiling, which allows creating a criminal profile based on the investigation of the crime scene (through analysis and prediction of behavioural characteristics).

Some innovative means for investigating crimes are worth noting. Biometric identification systems have gained significant development, allowing to analyse not only fingerprints, external features and handwriting, but also the iris of the eye, DNA (including old and mixed samples), gait characteristics, etc. In this context, one can note the innovative German technology Eviscan (2023) for detecting hidden fingerprints and other hidden evidence. A feature of the technology is the absence of physical contact and the use of chemicals. After fingerprints are extracted, they are sent to specialized databases, in particular, the Integrated Automated Fingerprint Identification System (IAFIS) in the United States of America (Federal Bureau of Investigation, 2023) or Eurodac in the European Union (EU-LISA, 2023), for identification of a person that left them. Some modern technologies even make it possible to identify fingerprints in persons whose fingerprints are damaged in some way. Modern scanners can recognize a pattern that is under the skin and repeats the pattern of a fingerprint.

The latest tools can also be used in forensics, such as:

- mass spectrometers for the study of microparticles of materials found on the clothes of the criminal and their comparison with those found at the scene;
- 3D facial reconstruction – can recreate the face from the found remains for identification of the person;
- programmes for accessing hidden files on the computer;
- hyperspectral imaging technologies are used to detect minimal blood residues, etc.

Summing up the analysis, it can be noted that today there is a wide range of technical means that can be useful during the investigation of crimes in the field of tourism. However, it is worth remembering that the use of technical means in the investigation process must meet the requirements of current legislation. Otherwise, their use threatens to violate privacy.

An overview of the analytical smart functions of video surveillance cameras and their use for the detection and investigation of crimes in tourism

Considering the variety of crimes that can take place in the field of tourism, all the technologies mentioned in the previous section can be used in the course of their detection and disclosure. However, in the author's opinion, the latest video surveillance technologies deserve special attention. Video cameras can be installed in places where tourists gather, where the most frequent crime against tourists is theft, and cover a fairly large area. They can also monitor places with an increased risk of crime (criminal areas, remote areas, etc.), ensure the safety of tourist places of rest (parks, restaurants, clubs, etc.) and places to stay overnight (hotels, hostels, camping sites, etc.)). New features of modern video surveillance cameras allow not only to detect and investigate crimes, but also to predict them using a system of restrictions, in case of violation of which the alarm is activated.

Innovative functions of modern video surveillance cameras can be demonstrated using the example of Hikvision equipment (Hikvision, 2023). In particular, the latest models can perform a number of functions to solve the following tasks:

- signal an alarm in the event of an invasion of the area or when crossing a line specially defined by the user (new models recognize and ignore animals);
- signal if the lens is closed or the focus is broken (in particular, if it was covered with a hand, an object, painted over, sticked in whole or in part, etc.);
- give an alarm signal when the sound exceeds the set level — loud sounds, shouts, etc. may indicate a security breach, an attack, etc. (the function is available in cameras with a microphone);
- identify objects left unattended — with the specified sensitivity they can detect abandoned objects, which can be useful, for example, to prevent terrorist acts;
- record car license plates;
- identify a person;
- count the number of people in the frame (Hikvision, 2023).

Analysis of the mentioned tasks shows that such video surveillance cameras (smart cameras) are primarily aimed at preventing crimes, because an alarm signal is triggered if the specified conditions are met. However, if the signal did not work (for example, because of incorrectly defined sensitivity or other parameters), the material recorded by the camera can be used to identify criminals and further investigate the crime. For example, if the hotel is equipped with such technology, it is possible to allow only guests' cars to enter the hotel, and to the rooms — only the people staying in them. It is also necessary to ensure proper lighting of the territory that is the object of surveillance for the camera (Myroshnychenko et al., 2020). It is quite easy in the case of a hotel area, but in the case when the camera is installed, for example, in a criminal area, the installation of proper street lighting can cause certain difficulties. In addition to financial costs, the possibility that the lanterns may be broken by intruders poses certain difficulties.

In addition to hotel territory and areas with a high level of crime, an important example of the effective use of video surveillance cameras is their installation in places with a large flow of tourists. For example, in airports or other places of large crowds. Such measures can be effective not only for the prevention or investigation of minor crimes (for example, theft), but also for the prevention of such serious crimes as terrorist acts.

On the one hand, wide opportunities of video surveillance increase security in tourist places, but they can affect privacy. Besides, each country has legislative provisions regarding the possibility of using video and photo materials (as well as other evidence obtained, in particular, with the use of technical equipment) as evidence. In Ukraine, the use of operational equipment by the National Police is provided for in Articles 30-32 of the Constitution of Ukraine (The Constitution of Ukraine, 2020). These articles provide for the possibility of restricting certain rights and freedoms of a person, in particular, the inviolability of housing, the secrecy of correspondence, telephone conversations, non-interference in personal and family life, etc., in the presence of a court decision or in the case when obtaining the necessary information related to a criminal violation by other means is impossible. According to the Criminal Procedure Code (CPC) of Ukraine (Código de Procedimiento Penal No. 4651-VI, 2012), video materials can serve as evidence in a criminal case.

At the same time, some controversial points regarding the use of evidence obtained with the use of video records are worth noting. For example, given the long time it takes to investigate crimes in tourism, which is typical of such crimes given the distance (for example, if the victim lives in another country), it could be useful to use video footage of the interrogation as evidence in court. The duration of the investigation may cause forgetting of certain facts that were observed during the interrogation. However, according to Article 23 of the Criminal Procedure Code of Ukraine "Direct examination of testimonies, objects and documents" (Código de Procedimiento Penal No. 4651-VI, 2012), testimony given in the pre-trial investigation cannot be used as evidence in court, which is provided because of the possibility of putting pressure on the suspect during interrogation.

The following most important conclusions can be drawn from the conducted research. First, in the conditions of increasing threats of various origins, in particular, for international tourists, increasing the effectiveness of the investigation process is an objective necessity. Secondly, the use of technical measures can significantly improve this process by providing additional evidence, as well as prevent a number of crimes. Thirdly, investigative actions must comply with legal requirements. The legislative framework, in turn, must be constantly optimized in accordance with the development of technologies in order to enable the legal application of the necessary technical means. In this regard, future studies should take into account not only methodological features of the use of technological means, but also proposals for improving the legislative framework.

Discussion

So, the use of technical equipment to detect and investigate crimes in tourism is an effective measure to increase the number of solved crimes. Besides, technical equipment is an effective measure to prevent crimes. However, during their use, a detailed study of the legislation of the country in which the crime is being investigated is necessary in order to determine whether the use of technical equipment does not violate certain legal provisions, as well as to determine the possibility of using the obtained materials as evidence.

The author of this study examines, first of all, crimes committed against tourists. Some studies also describe deviant behaviour of tourists themselves, as well as violations by tourism industry establishments. Mataković and Cunjak Mataković (2019) distinguish crimes in tourism into those committed by locals, tourists, and representatives of the tourism industry. All types of crimes are united by the fact that most often their goal is to obtain economic benefit.

A number of studies noted not only the possibilities of using technical equipment to detect and investigate crimes in tourism, but also the negative aspects of using innovative technologies, for example, video surveillance or computer technologies. Buhalis (2020) notes such a negative side of the application of innovative technologies in tourism, such as privacy violations, system malfunctions, inefficiency, etc. Therefore, there must be an appropriate balance between the implementation of technology and common sense. Pencarelli (2020) notes that the use of technical equipment in the tourism sector can raise the issue of cyber security. When the tourism system is dependent on network connections, the actions of cybercriminals can cause the paralysis of the entire system, which can pose, among other things, a danger to people's lives and health. These findings are mostly related to ensuring the tourists' safety and crime prevention, touching on the means used by the tourism industry itself. During detection and investigation of crimes, the use of technical equipment is often justified and effective, although it also requires taking into account legislative norms regarding the protection of human rights and freedoms.

Some researchers noted the advantages of using technical equipment to investigate crimes. Teplytskyi (2020) notes that the investigation of crimes involving computer can be significantly optimized using such mobile forensics tools as hardware, software, hardware recording blockers, computer forensics software, etc. Hua et al. (2020) note that technology can help control criminal activity, but they also create new crime problems. First of all, this is related to the possibility of information leakage. The researchers noted that academic studies in the relevant field widely reveal the problem of information leakage, but little attention is paid to the connection between crime and technologies such as fingerprint access, natural language recognition, robotics and online payments. Vakhitova et al. (2023) note the insufficient effectiveness of such means as a concierge in the hotel, and a room safe in the hotel room. Therefore, the researchers emphasize the need for further research into ways to increase security in places where tourists live. At the same time, the authors note that excessive and/or intrusive security measures can also scare away tourists or affect their privacy. It is worth confirming that the use of technical equipment provides significant advantages, but is always associated with certain risks, which must be considered during the implementation of technical equipment.

Some studies examine problems only indirectly related to the use of technological means to detect and investigate crimes in tourism but expand the research issue by identifying industry- specific problems. In their study, Buil-Gil and Mawby (2023) note the problem of tourists' reluctance to report crimes committed against them to the police. The researchers emphasize the need for measures to encourage visitors to report crimes to the police. For example, by informing tourists to turn to police units or special tourist services in the event of a crime in the hotel.

Some studies, like the author's article, deal with the legal aspects of using video materials as an evidence base. Xiao et al. (2019) note that video materials are often used as a source of primary evidence in judicial investigations. The work of Chaplynskyi (2022) revealed the peculiarities of the organization and tactics of interrogation while conducting tourism-related criminal investigations. The work states that, according to the National Police, only 33% of respondents noted technical equipment as a frequently used tactical technique. Venherova (2020) reveals the problems associated with the impossibility of using video footage of such an interrogation as evidence in court (according to the legislation of Ukraine). So, it can be concluded that the use of video materials during the investigation has its own peculiarities, which depend on the legislation of the country, as well as the subjective views of police officers regarding the use of such means.

Conclusions

Criminal offenses in tourism are quite common. The study proved a close relationship between the number of tourists in the country and the level of crime by conducting a correlation analysis. The results of the analysis showed the presence of a correlation of 0.5938. From this we can conclude that a large number of tourists can be the reason for a high level of crime.

Victimization of tourists is caused by a number of factors that explain why tourists often become victims of criminals. This is most often justified by the following main reasons: first, tourists are quite easy targets; second, they do not always refer to the police; third, even if tourists do contact the police, they are unlikely to be able to put pressure on them because they return home to another country after vacation. So, impunity creates new crimes, which makes it necessary to find new ways of detecting and investigating crimes. One of the most effective methods is the use of technical equipment by law enforcement agencies.

The study revealed the main capabilities of technical equipment for detecting and investigating crimes in tourism. Such fields of forensic technology as the use of photo and video recording devices, traceology, weapon examination, handwriting examination, document examination, identification of a person by appearance, phonoscopy, odourology, physical evidence examination, forensics, forensic profiling, etc., were described. The use of smart video surveillance cameras was noted as an effective tool for detecting and investigating crimes in tourism. It was established that the smart functions of such cameras can be useful not only for the detection and investigation of crimes, but also for their prevention. Examples of the use of video surveillance cameras on the hotel territory, in criminal areas and in places with a large concentration of tourists are considered. It is emphasized that the use of technical equipment during the detection and investigation of crimes must be justified by the legislation of the country in which the investigation is taking place. Comparing the results of the research with other works of the authors, one can note the contribution of the author's research, which consists in revealing the specifics of the use of technical means for the detection and investigation of crimes in the tourism sphere.

Further areas of research may involve studying the specifics of crime detection and investigation capabilities in smart cities, as well as the advantages and disadvantages of the smart city concept in terms of its impact on crime.

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Implementación de un modelo sistémico en la enseñanza de nanotecnología para la educación básica: Un estudio de caso

Implementation of a systemic model in nanotechnology teaching for basic education: A case study

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Resumen

Este estudio presenta un innovador modelo de enseñanza para la nanotecnología en la educación básica, que integra estrategias diseñadas para fomentar el aprendizaje significativo. Se aplica la taxonomía SOLO para evaluar la efectividad de las respuestas de los estudiantes. En un esfuerzo por avanzar en la calidad educativa a nivel mundial, México se enfrenta a desafíos derivados de factores tanto externos como internos. Este modelo se basa en la metodología de sistemas blandos, tratando el proceso educativo como un sistema influido por su contexto social y político. La evaluación de la calidad educativa se realiza a través del análisis de índices de deserción escolar y eficiencia terminal, adoptando un enfoque sistémico para identificar y tratar los principales factores que impactan estos indicadores en la enseñanza de las ciencias a nivel básico. El modelo prioriza los aspectos críticos de la educación: contenido, evaluación, valores, entorno educativo y los roles fundamentales de profesores y estudiantes. Aunque específicamente desarrollado para la enseñanza de nanotecnología y nanociencia, el

Abstract

This study presents an innovative teaching model for nanotechnology in basic education, integrating strategies designed to promote meaningful learning. The SOLO taxonomy is applied to assess the effectiveness of student responses. In an effort to advance educational quality globally, Mexico faces challenges arising from both external and internal factors. This model is based on the soft systems methodology, treating the educational process as a system influenced by its social and political context. The evaluation of educational quality is carried out through the analysis of school dropout rates and terminal efficiency, adopting a systemic approach to identify and address the main factors impacting these indicators in science education at the basic level. The model prioritizes critical aspects of education: content, assessment, values, educational environment, and the fundamental roles of teachers and students. Although specifically developed for the teaching of nanotechnology and nanoscience, the model offers flexibility to adapt to other subjects, ensuring harmony between the objectives, goals,

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modelo ofrece flexibilidad para adaptarse a otras materias, asegurando una armonía entre los objetivos, metas y recursos disponibles dentro del contexto de la Nueva Escuela Mexicana.

Palabras clave: Modelo de enseñanza, educación básica, sistemas suaves, proceso enseñanza-aprendizaje (PEA), nanociencias para niños.

and resources available within the context of the New Mexican School.

Keywords: Teaching model, basic education, soft systems, teaching-learning process (PEA), nanosciences for children.

Introducción

La calidad educativa se enfoca en satisfacer las expectativas de la sociedad, valorándose por la habilidad del sistema educativo para responder a las demandas de la población, según Edwards (1991). En un contexto marcado por la globalización, el rápido avance tecnológico y las expectativas en constante evolución, resulta crucial formar individuos dotados de los conocimientos, habilidades, actitudes y valores necesarios para comprender, influir y mejorar su entorno. La necesidad de desarrollar este modelo de enseñanza de nanotecnología surge de desafíos específicos, como la brecha entre el avance acelerado en el campo de la nanotecnología y la capacidad de los sistemas educativos tradicionales para integrar estos avances de manera efectiva en sus currículos. Además, se enfrenta al reto de satisfacer la creciente demanda de profesionales capacitados en nanotecnología, lo que implica la necesidad de revisar y adaptar los métodos pedagógicos para incluir enseñanzas especializadas que respondan tanto a las necesidades del mercado laboral como a los imperativos de la innovación y el desarrollo sostenible.

La necesidad de innovación en la educación es imperante, enfocándose en metodologías activas como el 'aprender haciendo', que permiten a los niños interactuar directamente con los materiales, empleando pequeñas cantidades para experimentar y explorar las bases de la nanociencia. Esta aproximación práctica busca no solo fomentar la curiosidad y el interés en las ciencias desde una edad temprana sino también promover la inclusión y potenciar las áreas de STEAM (Ciencia, Tecnología, Ingeniería, Artes y Matemáticas), asegurando que los beneficios de estas intervenciones educativas se proyecten a largo plazo y contribuyan a formar una sociedad más preparada y equitativa. El aprendizaje basado en indagación bajo enfoque STEAM es un enfoque interdisciplinario para ofrecer explicaciones desde las ciencias y los saberes de las comunidades.

Es fundamental desarrollar ciudadanos con una sólida cultura científica, ya que esto no solo mejora la gestión de la vida cotidiana, sino que también contribuye a abordar desafíos sanitarios y de supervivencia a nivel global, destaca (Bazán, 2006). No obstante, la educación moderna enfrenta un desafío significativo: la elección entre un conocimiento fragmentado y la necesidad de resolver problemas que son por naturaleza interdisciplinarios, multidimensionales y de alcance global, según (Morin, Ciurana, & Motta, 2002) sostiene que para que el conocimiento sea realmente relevante, es necesario integrar cuatro criterios esenciales que promuevan un aprendizaje significativo y, por ende, el desarrollo de una "inteligencia general".

La divulgación de la ciencia y tecnología se erige como una potente herramienta de comunicación que reúne a audiencias variadas, incluyendo expertos de diversas disciplinas, con el objetivo de aclarar temas específicos, según (Tutor Sánchez & Takeuchi, 2015). Este esfuerzo exige la capacidad de simplificar conceptos inherentemente complejos, haciéndolos accesibles y entendibles para todos (García & Foladori, 2015). Recientemente, la nanociencia y la nanotecnología han ganado notoriedad en la investigación, la divulgación y la educación científica, gracias a investigaciones de vanguardia con impacto social significativo, tales como el desarrollo de nuevos medicamentos, avances en materiales industriales y su aporte a la ciencia de materiales e ingeniería (Ledesma, 2019).

La formación en nanotecnología es crucial, ya que sienta las bases para el progreso científico en este campo y estimula a las nuevas generaciones, tanto en México como internacionalmente, a elegir carreras científicas (Winkelmann & Bhushan, 2016). Mediante su enseñanza, es posible destacar la amplia variedad de aplicaciones de la nanotecnología en la vida diaria. No obstante, la divulgación efectiva requiere de estrategias definidas que incluyen la formación de docentes, el empleo de un lenguaje claro, la aplicación de conocimientos prácticos, charlas interdisciplinarias y enfoques pedagógicos variados (Robinson et al., 2014).

Este estudio busca generar un impacto positivo en los estudiantes de nivel básico, introduciéndolos en el fascinante mundo nanométrico de la nanociencia y la nanotecnología para despertar su curiosidad, enriquecer su comprensión de estos campos y promover el desarrollo de habilidades científicas y tecnológicas (Rodríguez & Bernal, 2011). Este trabajo trasciende la teoría mediante un enfoque práctico y participativo: la creación de material didáctico innovador permite a los estudiantes experimentar y aplicar conceptos de manera activa y creativa (Capacho, 2011).

Marco Teórico

Este proyecto se enfoca en analizar un proyecto con el objetivo de comprender sus variables y frecuencias para, finalmente, sugerir soluciones en el desarrollo de modelos pedagógicos innovadores. Se fundamenta en la metodología de sistemas suaves, reconocida por su adaptabilidad, perdurabilidad y capacidad para abordar problemas no estructurados con significativas repercusiones sociales y políticas. A diferencia de enfocarse exclusivamente en los problemas inmediatos, esta aproximación se concentra en las circunstancias subyacentes que los originan.

Azabache (2012) (Acuña Salinas, 2020) señala que el diseño educativo está condicionado por un entorno dinámico, en el que intervienen factores sociales, políticos, económicos e históricos, impactando directamente en aspectos críticos como la reprobación y la deserción en asignaturas científicas.

(Checkland & Poulter, 2020) amplía esta visión identificando tres retos principales en el campo científico:

- **Complejidad Global:** El mundo, en su intrincada naturaleza, ha requerido que su estudio se divida en disciplinas específicas, como física o biología.
- **Ciencias Sociales:** A diferencia de las ciencias naturales con teorías consolidadas, las ciencias sociales no cuentan con leyes generales y enfrentan dificultades en la predicción de fenómenos sociales.
- **Aplicación Real de la Ciencia:** La toma de decisiones y la administración presentan problemas inherentes en la aplicación directa de la ciencia al mundo tangible.

(Checkland, 1999) y (Rennie, 1992) proponen la metodología de sistemas suaves como un enfoque flexible para la resolución de problemas. Esta metodología, estructurada en siete fases, se fundamenta en principios de aprendizaje y está diseñada principalmente para analizar y mejorar situaciones complejas en la realidad, promoviendo el pensamiento sistémico en sus etapas clave.

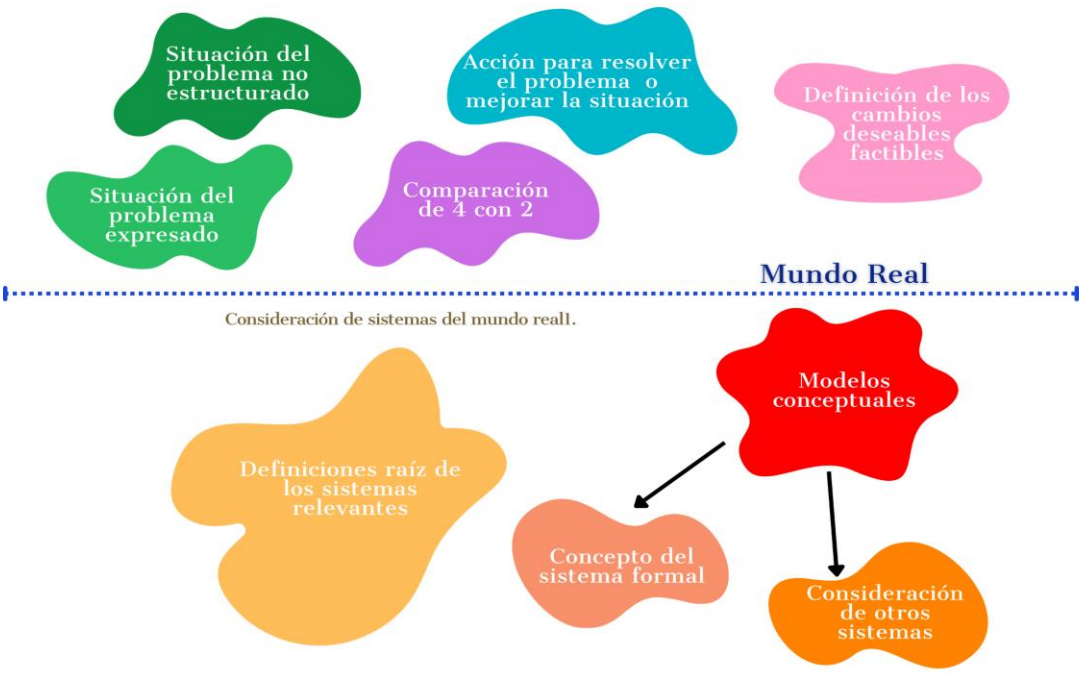

Figura 1. Metodología para sistemas blandos (Checkland & Scholes, 1999)

Para la presente investigación, se ha seleccionado el modelo de investigación como marco metodológico, debido a que este modelo presenta una estructura interna definida que reconoce y aborda problemas de naturaleza científica.

Esta estructura sirve como soporte esencial para la organización de los contenidos que se impartirán a los estudiantes (Ruíz, 2007). Las características distintivas del modelo de investigación incluyen:

- ***Participación Activa del Estudiante:*** *El modelo promueve que los estudiantes se involucren activamente en la construcción del conocimiento. Utilizan su saber previo como punto de partida para abordar y resolver proyectos o mini-proyectos.*
- ***Rol Proactivo del Docente:*** *Dentro de este modelo, es imperativo que el docente pueda diseñar y plantear problemas que sean relevantes y significativos para los estudiantes et al:* (Ruíz, 2007) *sugiere que, bajo este enfoque, el docente debe:*

- Diagnosticar las ideas previas de los estudiantes y facilitar la construcción de nuevos conocimientos.
- Fomentar la adquisición de habilidades de orden cognitivo.
- Estimular actitudes positivas hacia la ciencia y fomentar comportamientos científicos.
- Tender puentes entre el conocimiento científico y el conocimiento cotidiano.
- Evaluar y calibrar el nivel de comprensión científica de los estudiantes.

Con esta estructura y orientaciones, el modelo de investigación propone un enfoque pedagógico que busca una participación activa del estudiante y un rol dinámico y orientador del docente, considerando cuatro factores para que el conocimiento tenga sentido de pertinencia, los cuales son: el contexto, lo global (las relaciones entre todo y partes), lo multidimensional y lo complejo. (Tabla 1).

Tabla 1.
Los cuatro factores que se deben considerar para que el conocimiento sea pertinente.

1. El contexto	2. Lo global (las relaciones entre todo y partes)	3. Lo multidimensional	4. Lo complejo
El conocimiento de las informaciones o elementos aislados es insuficiente. Hay que ubicar las informaciones y los elementos en su contexto para que adquieran sentido. Para tener sentido la palabra necesita del texto que es su propio contexto.	Lo global es más que el contexto, es el conjunto que contiene partes diversas ligadas de manera inter-retroactiva u organizacional. De esa manera, una sociedad es más que un contexto, es un todo organizador del cual hacemos parte nosotros.	El conocimiento pertinente debe reconocer esta multidimensionalidad e insertar allí sus informaciones: se podría no solamente aislar una parte del todo sino las partes unas de otras.	El conocimiento pertinente debe enfrentar la complejidad. *Complexus* significa lo que está tejido junto; en efecto, hay complejidad cuando son inseparables los elementos diferentes que constituyen un todo.

Adaptado de (Morin, Ciurana, & Motta, 2002).

La educación contemporánea se halla ante múltiples retos y dificultades. Estos desafíos pueden originarse tanto por factores exógenos como endógenos. Tradicionalmente, se ha intentado abordar estas problemáticas de forma segmentada y lineal, siguiendo un "Enfoque analítico".

Esto implica que no se han tratado como componentes de un sistema unificado; un sistema se define como una entidad cuya existencia y funcionalidad dependen de la interacción armónica de sus componentes. En este contexto, cada componente está interconectado y colabora de manera cohesiva, de acuerdo con el "Enfoque sistémico" (García & Reséndiz, 2017).

El enfoque sistémico se presenta como una metodología que organiza el conocimiento con el propósito de optimizar la acción (Rosnay, 1997). Por el contrario, el enfoque analítico busca fragmentar el conjunto para examinar cada elemento de forma individual, obviando las interconexiones y la dinámica global a la que pertenecen (Sáenz, 2009).

La **Tabla 2** subraya las diferencias fundamentales entre estos dos enfoques.

Tabla 2.
Las diferencias fundamentales entre el enfoque analítico y el enfoque sistémico.

Enfoque analítico	Enfoque sistémico
Aislado: Se centra en los elementos	Relacionado: Se centra en las interacciones entre los elementos.
Considera la naturaleza de sus interacciones.	Considera los efectos de las interacciones.
Se preocupa por la precisión del detalle.	Se preocupa de la percepción global.
Independencia de la duración: los fenómenos considerados son reversibles.	Integra la duración y la irreversibilidad.
La validación de hechos se realiza por prueba experimental dentro del marco de una teoría.	La validación de hechos se realiza por comparación del funcionamiento del modelo con la realidad.
Modelos precisos y detallados, aunque son difícilmente utilizables para la acción.	Modelos insuficientemente rigurosos para servir de base al conocimiento, no obstantes, son utilizables en la decisión y acción.
Enfoque eficaz cuando las interacciones son lineales y débiles.	Enfoque eficaz cuando las interacciones son no lineales y fuertes.
Conduce a una acción programada en detalle.	Conduce a una acción por objetivos.
Conocimiento de los detalles, metas mal definidas.	Conocimiento de las metas, detalles borrosos.

Adaptado de (Rosnay, 1997).

Así, se adoptará la *Teoría General de Sistemas (TGS)*, que ha sido empleada en múltiples contextos como los físicos, biológicos, culturales y psicológicos (Mobus & Kalton, 2015). Su principal propósito es "analizar la realidad de manera global y las disciplinas que se enfocan en cómo los humanos abordan la solución de problemas, ya sea para comprender fenómenos o para intervenir en ellos" según lo señala et al: (Latorre, 1996).

Desde la perspectiva educativa, la TGS nos permite concebir el *proceso enseñanza-aprendizaje (PEA)* como un sistema donde diferentes actores convergen hacia un objetivo común. Un sistema se describe como "un conjunto integrado por componentes interconectados de manera organizada, en el que las partes se influencian mutuamente dentro del sistema y se transforman al salir de él" (Van Gigch, 2012).

El PEA es entendido como un mecanismo de comunicación deliberada entre docente y alumno, desarrollándose principalmente en el aula, enmarcado por un contexto institucional (la escuela o centro educativo) que ofrece las condiciones adecuadas para diseñar estrategias dirigidas al aprendizaje. Por ende, el PEA debe incorporar las características esenciales de un sistema, tal como lo señala (Bertalanffy, 1986), ver Figura 2.

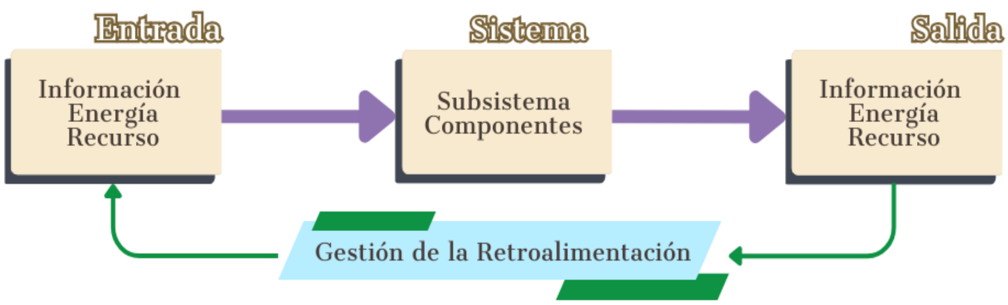

Figura 2. Funciones básicas realizadas por un sistema.
Adaptado de (Bertalanffy, 1986).

- ***Entrada****: Es la fuerza de arranque que proporciona la información, energía o materia al sistema.*
- ***Salida****: Las salidas son el resultado de un proceso de transformación en el que se integran los elementos y sus relaciones, los*

cuales deben ser afines con el objetivo del sistema.

- ***Retroalimentación**: Es la función de regreso que tiene un sistema para confrontar la salida con algún criterio preestablecido que gestiona el cumplimiento del propósito del sistema.*

El PEA, al igual que la TGS, trabaja con diferentes niveles de complejidad, como se observa en la Figura 3.

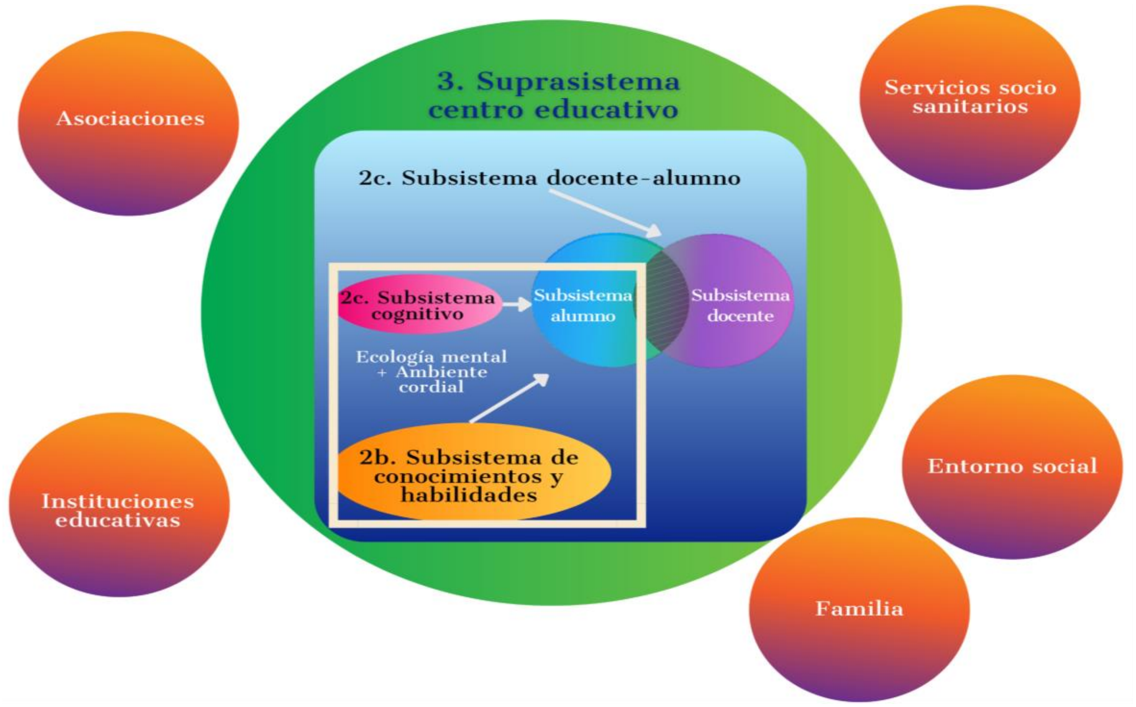

Figura 3. El sistema y suprasistema del *Proceso de Enseñanza-Aprendizaje*. Adaptado de (Compañ, 2018).

Los niveles de complejidad inherentes al PEA son:

- **Sistema:** Refiere al proceso integral de enseñanza-aprendizaje.
- **Subsistemas:** Estos constituyen los componentes del sistema principal. Dentro de estos encontramos:

a) **Subsistema cognitivo:** (Luffiego et al., 1991) et al**:** lo define como "una estructura dedicada a la selección, almacenamiento y procesamiento de información, dotada de capacidades distintivas de la especie humana, pero sujeta a variaciones individuales".

En la Figura 4 se ilustra la interacción entre la información y el subsistema cognitivo, visualizándolo como un sistema abierto influenciado por diversos elementos, tales como la motivación, la información y la estructura conceptual. Estos factores inciden directamente en el aprendizaje, dado que, según (Johansen, 2004), el conocimiento "se expande mediante la absorción de información, es decir, al integrar mensajes que reconfiguran el entendimiento del receptor".

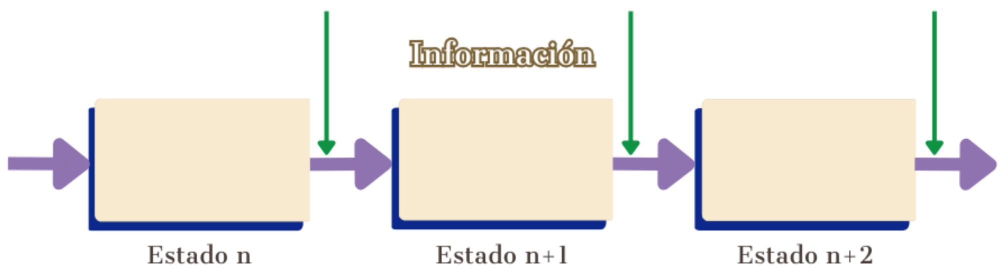

Figura 4. Influencia de la información en el sistema de cognición Adaptado de (Luffiego et al., 1991)

La Figura 5 ilustra cómo la información se conceptualiza como un conjunto de datos procesados que poseen relevancia y significado. En contraposición, el conocimiento se construye a partir de la información enriquecida por experiencias, reflexiones e interpretaciones, elevando su valor y haciéndolo esencial para la toma de decisiones y la implementación de acciones (Davenport, De Long, & Beers, 1998).

Figura 5. Proceso de convertir los datos en información y la información en conocimiento.
Adaptado de (Davenport, De Long, & Beers, 1998).

b) **Subsistema de Conocimientos y Habilidades**: El conocimiento se conceptualiza como un enfoque estructurado para deducir principios y esclarecer fenómenos, proporcionando soluciones a situaciones problemáticas (Morin, Ciurana, Motta, 2002) argumentan que "el pensamiento sistémico u organizacional permite establecer conexiones entre el conocimiento de las partes individuales y el conocimiento global, y viceversa".

c) ***Subsistema Docente-Alumno:*** Este se define como un sistema social, compuesto por actores clave: estudiantes y docentes. La finalidad primordial de este subsistema es fomentar un ambiente propicio para el aprendizaje.

- **Suprasistema:** Representa el entorno que envuelve al proceso educativo. En el contexto de este estudio, el suprasistema es el centro educativo, que se identifica como un sistema abierto debido a su continua interacción y adaptación al ambiente (Capacho, 2011) lo describe como una entidad que "se engancha en interacciones sociales a través de un currículo, situado en un contexto socio-histórico específico".

Es esencial reconocer que, al ver al centro educativo como un sistema abierto con la responsabilidad principal de prosperar mediante la adaptación y el intercambio de recursos con su entorno, se adopta una perspectiva socio-técnica. Esta perspectiva está compuesta por dos subsistemas esenciales, como se detalla en la Figura 6.

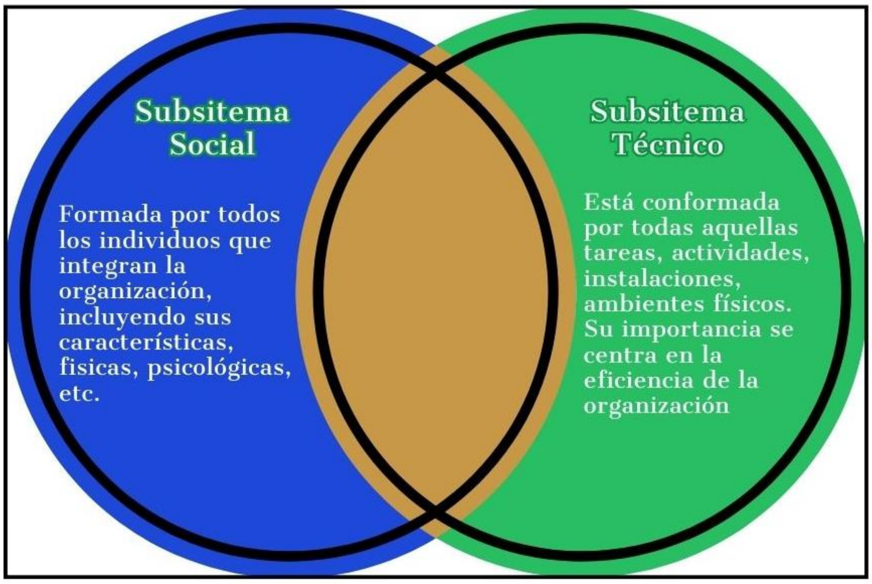

Figura 6. Los subsistemas que conforman al sistema socio-técnicos.
Adaptado de (Stan, s.f)

Finalmente, es esencial destacar el entorno del sistema, que comprende todos los factores externos que circundan y afectan al centro educativo, influyendo en su comportamiento y trayectoria evolutiva. La relevancia radica en la interacción bidireccional entre el sistema y su entorno. Esta dinámica permite que tanto el sistema influya en su entorno como viceversa (Sáenz, 2009).

Metodología

Aplicación de la taxonomía *SOLO (Structure of Observed Learning Outcomes) / ERAO (Estructura del Resultado del Aprendizaje Observado).*

El objetivo es desarrollar un modelo con estrategias didácticas basadas en un enfoque constructivista, facilitando así la asimilación de conceptos por parte de los estudiantes. Para evaluar los logros obtenidos, se utilizará la taxonomía SOLO *(Structure of Observed Learning Outcomes*) o, en su versión en español, ERAO *(Estructura del Resultado del Aprendizaje Observado*).

Esta taxonomía se organiza jerárquicamente en cinco niveles. Cada nivel incorpora verbos específicos que actúan como indicadores para medir el grado de comprensión o la profundidad del entendimiento del estudiante sobre un tema determinado (véase Figura 7).

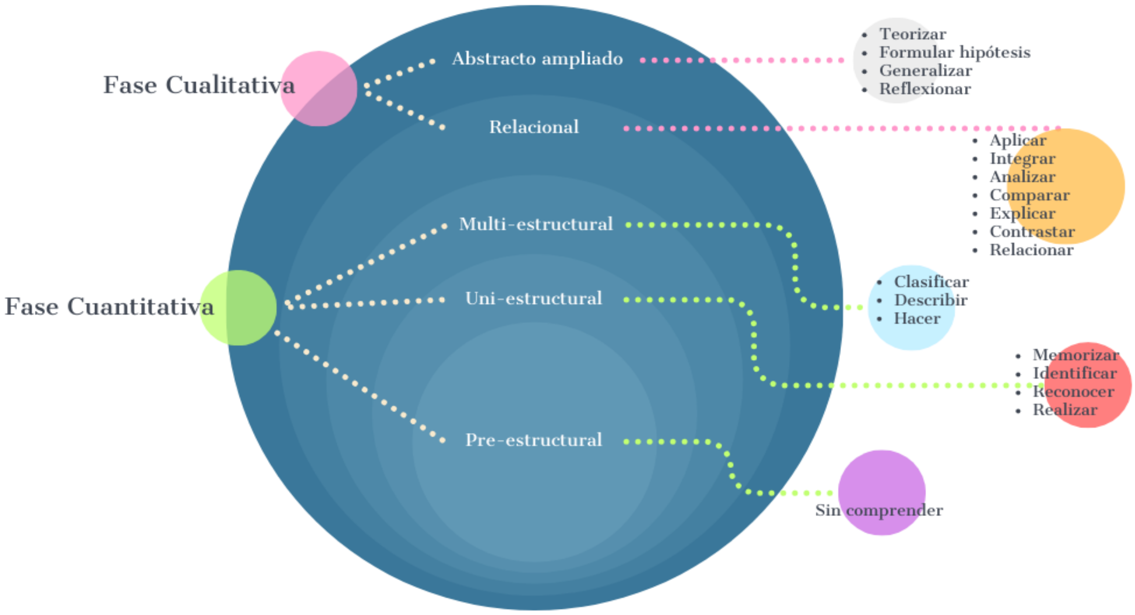

Figura 7. Los niveles de entendimiento y sus respectivos verbos que sugiere la taxonomía SOLO. Adaptado de (Biggs & Collis, 1982).

La taxonomía SOLO clasifica sus tres primeros niveles en una fase cuantitativa y los dos últimos en una fase cualitativa, los cuales se explican en la Tabla 3.

La taxonomía SOLO en dos fases, una fase cuantitativa que considera sus tres primeros niveles de entendimiento y una fase cualitativa que considera los dos últimos, los cuales se describen en la Tabla 3.

Tabla 3.
Descripción de los Niveles entendimiento de la taxonomía SOLO.

Fases	Nivel de entendimiento	Enfoque sistémico
Fase cuantitativa	Pre-estructural	El alumno no ha comprendido los conceptos. Sus respuestas son equivocadas y sin sentido.
	Uni-estructural	Sus respuestas son correctas para una parte específica del tema o tarea.
	Multi-estructural	El estudiante es capaz de contestar a diferentes aspectos del mismo tema de manera puntual, sin embargo, no muestra evidencias de poder integrar estos aspectos de manera conjunta.
Fase cualitativa	Relacional	El alumno tiene la capacidad de integrar los componentes de una temática en un conjunto coherente.
	Abstracto ampliado	En este nivel el alumno da respuesta a los cuestionamientos, más allá de lo trabajado en clase, se ha logrado que el estudiante sea activo en la construcción de su propio conocimiento.

Adaptado de (Biggs & Collis, 1982).

La información se recaba en la fase 1. En la fase 2 se diseñó una visión enriquecida en donde se expone el problema de forma estructurada con sus principales actores y relaciones que afectan al proceso de aprendizaje; entre los que destacan los factores intrapersonales e interpersonales (Ver Figura 8).

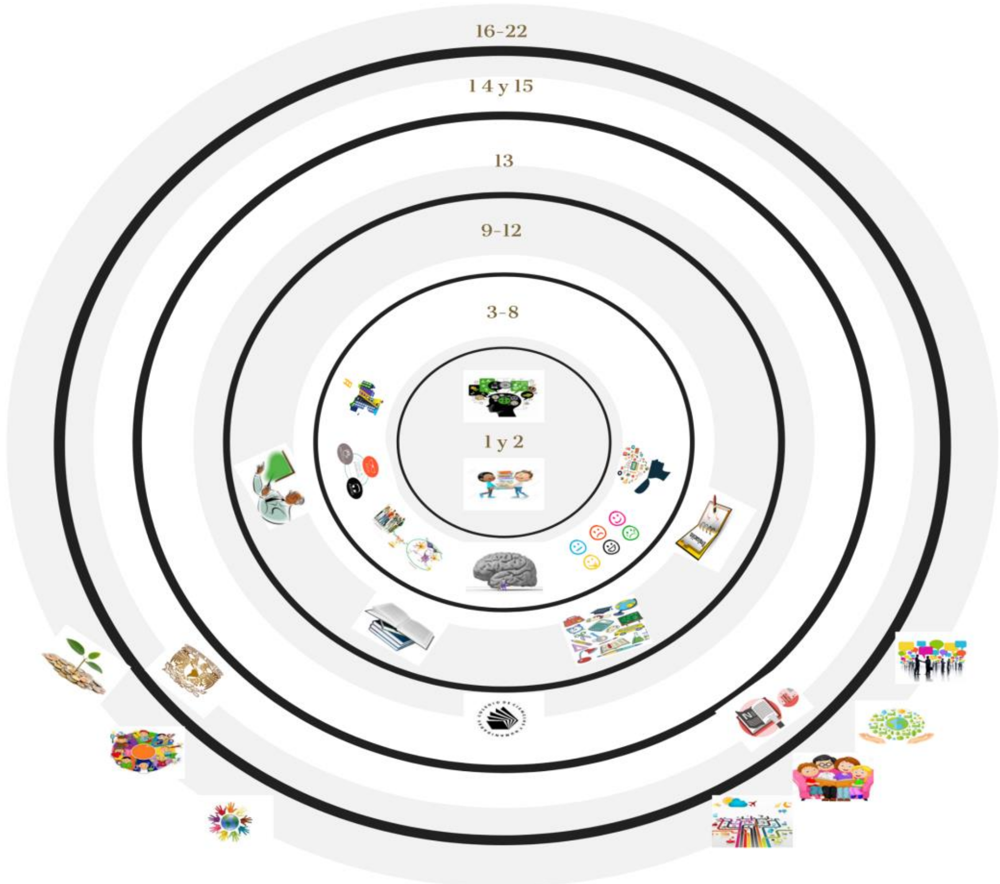

Figura 8. Visión enriquecida del proceso de aprendizaje.
Elaboración propia.

En la Tabla 4 se definen los significados de cada imagen que conforma la visión enriquecida de la Figura 8.

Tabla 4.
Definiciones de la visión enriquecida del proceso de enseñanza-aprendizaje.

No.	Icon	Meaning
1		Proceso de Aprendizaje
2		Alumnos
3		Motivación
4		Estilos y tipos de aprendizaje
5		Desarrollo biológico
6		Desarrollo cognitivo
7		Desarrollosocio-emotivo
8		Desarrollo moral
9		Docente
10		Planes y programas de estudio
11		Materiales y recursos didácticos
12		Evaluación
13		Nivel Básico
14		UNIVERISIDAD VERACRUZANA
15		SECRETARIA DE EDUACIÓN Normatividad y lineamientos
16		Recursos económicos
17		Compañeros
18		Factores axiológicos
19		Infraestructura (AULA)
20		Familia
21		Contexto
22		Campo laboral

Elaboración propia.

El modelo sistémico de enseñanza se estructura en cuatro fases esenciales:

- **Planeación:** Durante esta fase, es imperativo que el docente considere los conocimientos previos del alumno, así como las creencias compartidas, tanto por él como por sus estudiantes. Es fundamental tener en cuenta el contenido específico de Nanociencias y los objetivos alineados a la temática a desarrollar, sin omitir la dimensión axiológica, es decir, los valores. Para determinar los conocimientos previos de los estudiantes, es aconsejable realizar una evaluación diagnóstica basada en la taxonomía SOLO, que refleje tanto su nivel cognitivo como sus factores intrapersonales.

- **Diseño:** Esta fase se centra en la preparación meticulosa de estrategias, actividades, materiales y/o recursos educativos derivados de la información recopilada en la fase de planeación. La creación de estos materiales se basa en proyectos, ya sean reales o simulados, pues estos promueven habilidades cognitivas en los estudiantes. Un ejemplo puede ser el diseño de mini-proyectos (prácticas) orientados a responder ciertas interrogantes en contextos reales. Este modelo está imbuido de un enfoque constructivista, promoviendo la integración de nuevos conocimientos basándose en las experiencias y saberes previos del estudiante.
- **Implementación:** Durante esta etapa, se ponen en práctica los recursos y estrategias previamente diseñados, materializándose en la interacción docente-alumno.
- **Evaluación:** Esta fase se desglosa en tres momentos clave: inicial, intermedio y final, también conocidos como modelo 3P (Presagio, Proceso y Producto). Esto implica primero determinar el nivel inicial de los estudiantes a través de una evaluación diagnóstica. Este conocimiento inicial guiará la implementación y diseño de estrategias posteriores. A lo largo del proceso, se evaluará de manera recurrente la eficacia y eficiencia del modelo en relación con el progreso de los estudiantes, identificando su nivel cognitivo en consonancia con la taxonomía SOLO, como se detalla en la Tabla 5.

Tabla 5.
Niveles de comprensión de acuerdo a la taxonomía SOLO.

TAXONOMÍA SOLO	Niveles de comprensión		
Nivel 1. Pre-estructural	Sin comprender		
Nivel 2. Uni-estructural	Nivel Simple	Nivel Complejo	Memorizar Identificar Reconocer Realizar
	Terminología	Cuestión conceptual	
Nivel 3. Multi-estructural	Nivel Simple	Nivel Complejo	Clasificar Describir Hacer
	Elementos desorganizados	Infinidad de detalles	
Nivel 4. Relacional	Nivel Simple	Nivel Complejo	Aplicar Integrar Analizar Comparar Explicar Contrastar Relacionar
	Integración de datos	Aplicación de conceptos a un problema.	
Nivel 5. Abstracta ampliada	Nivel Simple	Nivel Complejo	Teorizar Formular hipótesis Generalizar Reflexionar
	Aborda problemas	Cuestiona principios existentes.	

Adaptado de (Biggs & Collis, 1982).

La taxonomía de Bloom se basa en la clasificación de los objetivos educativos y está enfocado en tres puntos importantes que son: el cognitivo, afectivo y el psicomotor; por ello se utiliza como un apoyo para saber ¿cómo ir logrando los aprendizajes de un programa de estudio? y para el diseño de las estrategias. Se basa en diferentes etapas como se muestra en la Figura 9.

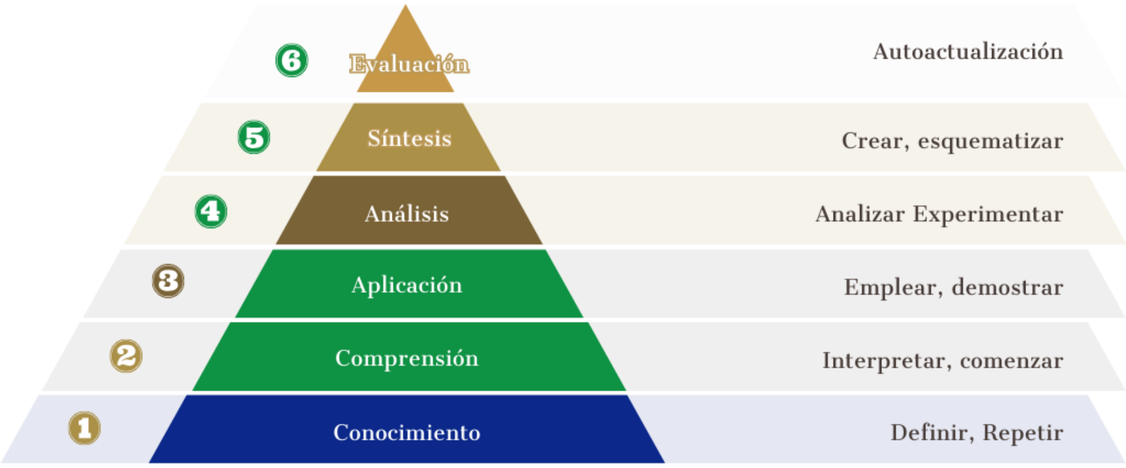

Figura 9. Niveles de los objetivos en la taxonomía de BLOOM
Adaptado de (Bloom, 1956).

Para cada uno de sus niveles tiene como apoyo un conjunto de verbos, que servirán como una guía para el docente, la cual permite analizar el mapa curricular y evaluar el nivel de aprendizaje o conocimiento a adquirir. Cada uno de los niveles tiene un propósito y son:

- ***Conocimiento:*** *Está enfocado en la memorización de información.*
- ***Compresión:*** *Entendimiento de la forma más simple de la información.*
- ***Aplicación:*** *La interrelación de la información y la realidad.*
- ***Análisis:*** *La división del todo en sus partes y la asimilación de cada una de sus partes.*
- ***Síntesis:*** *La comparación de la integración de sus partes, para construir un todo.*
- ***Evaluación:*** *La crítica para generar ideas nuevas y soluciones.*

La metodología de implementación del proyecto "Nano para Niñas, Niños y Jóvenes" integra las taxonomías de Bloom y SOLO a través de seis fases estratégicas:

Fase 1: Preparación y Alianzas

Bloom: Conocimiento – Crear conciencia sobre las nanociencias.
SOLO: Pre-estructural – Reconocimiento de la diversidad en el conocimiento.
Desarrollo: Establecimiento de alianzas y reclutamiento de instructores con énfasis en la adaptabilidad pedagógica para abordar los variados niveles de comprensión de los estudiantes en Nanociencias.

Fase 2: Capacitación de Instructores

Bloom: Comprensión y Aplicación – Capacitar en la teoría y práctica de las nanociencias.
SOLO: Uni-estructural – Enseñanza de conceptos clave individualizados.
Desarrollo: Formación exhaustiva de instructores en conceptos de nanociencias y técnicas didácticas, enfocándose en la comprensión y aplicación práctica de conceptos individuales.

Fase 3: Desarrollo Curricular

Bloom: Análisis – Diseñar el currículo con actividades que promuevan el análisis crítico.
SOLO: Multi-estructural – Distinguir y relacionar múltiples conceptos.
Desarrollo: Creación de un currículo que integre actividades prácticas y demostrativas, diseñadas para facilitar el análisis y la comprensión de la interrelación entre diversos conceptos de nanociencias.

Fase 4: Implementación del Programa

Bloom: Síntesis – Integrar conocimientos en experiencias prácticas.
SOLO: Relacional – Comprender las interconexiones de los conceptos.
Desarrollo: Ejecución de sesiones prácticas en las escuelas, permitiendo a los estudiantes experimentar la síntesis de conocimientos de nanociencias, efectuar experimentos para comprender conceptos básicos de nanociencias y entender sus aplicaciones prácticas y teóricas en el mundo real.

Fase 5: Evaluación y Mejora Continua

Bloom: Evaluación – Crítica y reflexión sobre el aprendizaje.
SOLO: Extendido Abstracto – Aplicación del conocimiento en nuevos contextos.
Desarrollo: Recopilación de retroalimentación y realización de evaluaciones sumativas para medir la comprensión y aplicación de conocimientos en nanociencias, permitiendo la mejora continua del programa.

Fase 6: Sostenibilidad y Escalabilidad

Bloom y SOLO: Integración avanzada – Extender la aplicación de conocimientos y habilidades.
Desarrollo: Estrategias para asegurar financiamiento y creación de comunidades de aprendizaje (células de aprendizaje) que promuevan la innovación y aplicación de las nanociencias en contextos variados y sostenibles en niveles superiores de educación, para alumnos con barreras de aprendizaje y en lenguas originarias.

Al integrar las taxonomías de Bloom y SOLO, el proyecto asegura un enfoque educativo holístico que no solo abarca la adquisición y comprensión de conocimientos, sino que también enfatiza la aplicación, el análisis, la síntesis y la evaluación de estos conocimientos en contextos reales y diversos. Esto permite desarrollar un aprendizaje profundo y significativo en nanociencias, fomentando la inclusión, la igualdad de oportunidades educativas y la estimulación de vocaciones científicas desde una edad temprana.

Resultados y discusión

El proyecto "Nano para Niños" en México busca promover la inclusión y el empoderamiento a través de la educación de calidad en ciencia y tecnología, alineándose con el Modelo de Ciudadanos del Mundo de la UNESCO, la Economía Circular y el Manifesto 2030. Con un enfoque en las nanociencias y nanotecnología, se propone igualar oportunidades educativas, especialmente para niñas, y fomentar prácticas sostenibles. El proyecto se sincroniza con el Manifesto 2030 al educar sobre materiales avanzados y su impacto en la sociedad, impulsando la innovación, la sostenibilidad y la colaboración comunitaria, con el objetivo de preparar a futuros innovadores en campos científicos y tecnológicos.

La Figura 10 muestra el modelo sistémico que integra el sistema cognitivo; en la segunda etapa se realiza una evaluación diagnóstica que depende del tiempo que el profesor disponga para su aplicación, pero para el diseño de la prueba es necesario incorporar los criterios de la taxonomía SOLO, para conocer el nivel de entendimiento que tienen los alumnos de la asignatura o de un tema en particular.

La tercera fase consiste en revisar los objetivos de aprendizaje que se desean alcanzar, para identificar las categorías cognitivas que se quiere lograr con los estudiantes, los cuales dependen de la asignatura, nivel académico, contexto, etc. En este punto el docente realiza un análisis de las habilidades y actitudes presentes y ausentes en el estudiante para realizar la planeación de sus clases.

La cuarta etapa incluye algunas actividades que propone Bloom para lograr las categorías cognitivas; estas se integran a las estrategias de enseñanza, su diseño depende del resultado de la etapa anterior, del tema, del aprendizaje y la asignatura que se desean abordar. Se hace hincapié que estas actividades que están en el esquema no son todas; únicamente son un ejemplo para cada categoría cognitiva.

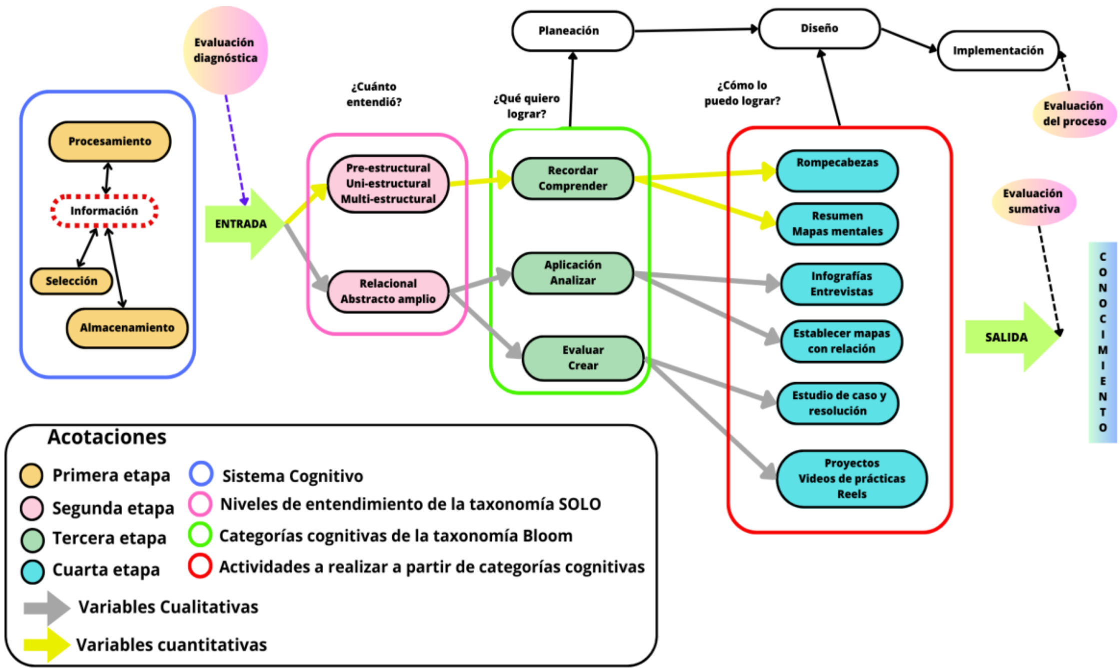

Figura 10. Modelo sistémico integrando la taxonomía SOLO y Bloom.
Adaptado de (Bloom, 1956).

La estrategia, ya revisada, se debe implementar con los alumnos y debe estar en constante evaluación para verificar si el proceso es eficaz y eficiente; por último, se aplica una evaluación sumativa para conocer el nivel de entendimiento alcanzado por el estudiante, de acuerdo con la taxonomía SOLO; esto permitirá identificar si el alumno fue capaz de transformar la información en conocimiento.

Un punto que se debe resaltar es que las evaluaciones deben ser congruentes con respecto a los objetivos propuestos en la planeación, que realmente midan las habilidades y actitudes que se pretenden alcanzar con los estudiantes. La evaluación debe de ayudar no para detener en el camino a los más débiles, sino para identificar el grado de avance de cada uno, de manera que se apoye a todos, teniendo en cuenta la situación individual, para que todos lleguen hasta el final, alcanzando el mayor nivel posible de competencia en los conocimientos y habilidades que establecen los planes y programas (Martínez, 2004).

Este estudio ha incorporado elementos tanto cuantitativos como cualitativos. Se incluyeron en este estudio los 50 alumnos por escuela en la estrategia STEAM (ciencia, tecnología, ingeniería, arte y matemáticas, por sus siglas en inglés), que fueron seleccionados para representar el nivel básico (Gómez, 1981). La selección de la muestra no fue aleatoria, fue asignada por autoridades educativas en función de variables como: nivel económico, infraestructura, tipo de escuela en zona urbana y es la única escuela Multigrado en la Ciudad de Poza Rica; Veracruz, México.

El proyecto "Nano para Niños " se implementó utilizando una metodología integrada basada en las taxonomías de Bloom y SOLO, dividida en seis fases estratégicas: preparación, capacitación de instructores, desarrollo curricular, implementación del programa, evaluación y mejora continua, y sostenibilidad y escalabilidad. Cada fase abordó distintos niveles cognitivos y estructurales, desde el reconocimiento de la diversidad en el conocimiento hasta la aplicación avanzada de este en contextos nuevos y variados. Durante la preparación, se establecieron alianzas y se reclutaron instructores, enfocándose en la adaptabilidad pedagógica para diferentes niveles de comprensión estudiantil en nanociencias. La capacitación de instructores incluyó formación teórica y práctica, mientras que el desarrollo curricular se centró en diseñar actividades para fomentar el análisis crítico y la interrelación de conceptos. La implementación permitió a los estudiantes experimentar prácticas de nanociencias, y la fase de evaluación aseguró la reflexión crítica y la aplicación de conocimientos en nuevos contextos. La última fase abordó la sostenibilidad del proyecto, promoviendo la innovación y la aplicación de nanociencias en contextos educativos ampliados. La estrategia pedagógica fue diseñada para ser inclusiva, enfocándose en romper ciclos de desigualdad de género y fomentar el interés en campos STEM desde una edad temprana. Los talleres prácticos y los kits de prácticas reforzaron la enseñanza, proporcionando a los educadores herramientas para enseñar conceptos de nanotecnología de manera accesible. Esta metodología permitió una enseñanza y aprendizaje profundos de las nanociencias, alineando la educación con el Modelo de Ciudadanos del Mundo de la UNESCO, y destacando la importancia de la educación para el desarrollo sostenible, la inclusión social y la igualdad de género. Los resultados del proyecto reflejan el éxito en la creación de un marco educativo que empodera a los estudiantes a través del conocimiento y la aplicación práctica de las nanociencias, preparándolos para contribuir al desarrollo sostenible y la innovación tecnológica.

Los talleres proporcionaron demostraciones prácticas centradas en aspectos fundamentales de la nanotecnología. Estos incluyeron la comprensión de conceptos como la nano escala, nanociencia, nanotecnología, nanopartículas y nanomateriales, entre otros. Se destacó la capacidad de los estudiantes para representar sus aprendizajes a través de prácticas de laboratorio, logrando explicar la nanotecnología de una manera clara y accesible.

La formación ofreció conceptos diseñados especialmente para educadores de nivel básico, tales como "tamaño y escala" y "propiedades dependientes del tamaño". Se abordaron temas relevantes para la vida cotidiana, poniendo énfasis en la presencia y uso de nanomateriales en el entorno (Figura 11).

Figura 11. Proyecto piloto en Poza Rica; Veracruz, México, dirigido a niveles de primaria en la zona urbana.

En grupos de trabajo, los capacitadores presentaron prácticas de nanociencia a todos los participantes (Figura 12).

Figura 12. Proyecto piloto en Veracruz, nivel primaria, escuela multigrado.

Los docentes de nivel básico que participaron en los talleres del proyecto “Nano para niñas y niños” compartieron comentarios positivos, demostrando un marcado interés por la nanociencia y expresando satisfacción por los contenidos abordados.

Adicionalmente, se elaboró un kit de prácticas con material informativo dirigido a estudiantes de nivel básico. Este recurso brinda a los educadores una herramienta de consulta y apoyo, ofreciendo información detallada sobre la nanotecnología y sus diversas aplicaciones.

Conclusiones

Este modelo incorpora elementos de la taxonomía SOLO, enfocada en evaluar la calidad de las respuestas de los estudiantes y definir objetivos curriculares claros, así como de la taxonomía BLOOM, que organiza los objetivos educativos según dominios cognitivos, afectivos y psicomotores. Esto asegura que los estudiantes no solo reciban información, sino que también logren comprenderla profundamente. Comprender significa aprehender la información en su totalidad: contextualizarla, distinguir sus partes y su conjunto, y discernir lo general de lo específico. Mientras que la mera transmisión de información no asegura su comprensión, una comunicación efectiva sí puede facilitarla.

El modelo sistémico propuesto destaca la esencialidad de una evaluación continua y adecuada en el proceso de enseñanza-aprendizaje. Esta evaluación beneficia no solo al alumno, sino también al docente, permitiéndole una retroalimentación continua y la oportunidad de reflexionar sobre la eficacia de su metodología de enseñanza.

La transformación de la información en conocimiento efectivo por parte del estudiante requiere la integración de cuatro componentes clave del sistema educativo:

- El sistema cognitivo, diseñado para seleccionar, almacenar, procesar y depurar información.
- La evaluación diagnóstica, para identificar necesidades y adaptar el aprendizaje.
- Los objetivos de aprendizaje específicos adaptados a cada disciplina.
- La implementación de actividades diseñadas para estimular el desarrollo cognitivo.

El éxito del proceso evaluativo depende significativamente de las competencias y actitudes del docente, quien debe apoyarse en el currículo y ajustar su enseñanza a las necesidades individuales de cada estudiante.

Para lograr los resultados educativos deseados, es crucial que el docente alinee de manera coherente las competencias a desarrollar, los resultados de aprendizaje esperados y las estrategias evaluativas a implementar.

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Formation of professional communication of non-language specialists in higher education institutions

Формування професійної комунікації фахівців немовних спеціальностей у закладах вищої освіти

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Abstract

The article reveals the meaning of the concept of "communication", and shows the effectiveness of professional communication and the communication space of non-language specialists in higher education institutions. The experimental research (ascertainment stage) made it possible to find out the existing level of formation of professional communication of specialists of non-language specialties in institutions of higher education, to single out shortcomings in the formation of professional communication of specialists, to single out the main factors affecting the insufficient development of professional communication of specialists and to develop in institutions of higher education necessary ways to overcome the insufficient development of the formation of professional communication of non-language specialists. Diagnosing the communicative competence of future specialists in non-language majors in institutions of higher

Анотація

У статті розкрито зміст поняття «комунікація», показано ефективність професійної комунікації та комунікаційного простору фахівців не мовних спеціальностей у закладах вищої освіти. Експериментальне дослідження (констатувальний етап) дозволило з'ясувати наявний рівень сформованості професійної комунікації фахівців не мовних спеціальностей у закладах вищої освіти, виокремити недоліки у формуванні професійної комунікації фахівців, виокремити основні фактори, що впливають на недостатній розвиток професійної комунікації фахівців та розробити у закладах вищої освіти необхідні шляхи подолання недостатнього розвитку сформованості професійної комунікації фахівців не мовних спеціальностей. Проведене діагностування комунікативної компетентності майбутніх фахівців не мовних спеціальностей у закладах вищої освіти та показано структуру комунікативної компетентності. На

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education was carried out and the structure of communicative competence was shown. At the formative stage of the experiment, to determine the actual level of formation of individual components of the communicative competence of future specialists, a diagnostic study was conducted using the diagnosis of the levels of formation of the components: cognitive-strategic, motivational-value, and activity-corrective. The rules of pedagogical communication for future specialists of non-language specialties have been developed.

Keywords: professional communication, professional activity, non-language specialists, higher education institutions, interaction of subjects.

формувальному етапі експерименту для визначення фактичного рівня сформованості окремих компонентів комунікативної компетентності майбутніх фахівців проведено діагностичне дослідження за допомогою діагностування рівнів сформованості компонентів: когнітивно-стратегічного, мотиваційно-ціннісного, діяльнісно-корегувального. Розроблено правила педагогічного спілкування для майбутніх фахівців не мовних спеціальностей.

Ключові слова: професійна комунікація, професійна діяльність, фахівці не мовних спеціальностей, заклади вищої освіти, взаємодія суб’єктів.

Introduction

The functional role of communication acquires a special and necessary social-practical and theoretical-methodological actualization at the current stage of socio-economic and political development, which is caused by its total penetration into all spheres of social life. This led to the establishment of new communicative processes, structures, and forms, which ensured a qualitative change in the social and communicative environment in the modern world (Kozakov et al., 2017).

By the trends of human development and the demands of society, professional education undergoes innovative and constant changes. The communicative competence of specialists has gained special importance in the modern information society and provides the extremely important ability to negotiate, cooperate, and solve complex socio-cultural and scientific-technical problems. The communicative competence of future specialists in this context is the key to realizing their potential (Kraievska, 2015).

The basis of the goals of education is communicative requirements for the individual, especially in higher education institutions of pedagogical direction. It is in the educational environment of these institutions that the formation of the pedagogical educational system of attitudes of the student of higher education towards himself, the environment, and the ability to self-determine in life and pedagogical situations takes place.

A modern institution of higher education aims to create fundamentally new models of communication as a basic institution. Modern institutions of higher education intensively join the unified communication system of society, which in turn dynamically interacts with the socio-cultural global environment. In society, communication processes lead to the creation of social and communication space in institutions of higher education. At the same time, the current state of functioning of institutions of higher education is characterized by a constant, intensive increase in social and communication own space, which can characterize the totality of communication infrastructure, intellectual resources, information, and information technologies and includes various categories of subjects. At the same time, the social and communication space of a higher education institution is a component of the communication space (Bilychenko, 2021).

The process of formation of professional communication of non-language specialists in institutions of higher education has significant shortcomings: lack of perception of professional communication as a value, lack of motivation of the majority of students of higher education for professional mastery of communication, ignoring the communicative potential of educational professional disciplines, inconsistency of the content of communication-oriented disciplines, lack of methodology complex formation of structural components of professional communication of non-language specialists.

The study of the problem of the formation of professional communication of non-language specialists in institutions of higher education requires the identification of pedagogical conditions for the effectiveness of the specified process and consideration of this urgent issue taking into account modern trends in the development of the information society.

Literature review

The system-creating character of professional communication of specialists in institutions of higher education as a phenomenon that is the basis of social human life completely determines the attempts of systematic research by various scientists.

Therefore, based on the comprehensive approach of the formation of professional communication of non-language specialists in higher education institutions, the theory of communication can count on obtaining the desired results – to develop successfully, to reflect all the complexity and diversity of communicative reality, to be constantly enriched and improved with new knowledge. This methodological approach enabled O. Kraievska (2015) not only to systematize the source base of the studied phenomenon, but also to single out methodological techniques for the proposed scientific problem; create a model of communication competence formation of future agricultural managers; justify and experimentally verify the developed pedagogical conditions for the effective formation of communicative competence of future specialists.

The research of O. Bilychenko (2021) is interesting, where the place of digital strategy is highlighted in the functioning of the social and communication space of a higher education institution, the need for the use of digital tools, the transition to new, digital learning models is substantiated in the university educational process, the peculiarities of the social and communication space of a higher education institution are revealed.

The research of O. Kiryanova (2019) is devoted to the formation of motives for self-education in the process of communication between a student of higher education and a teacher of a higher school and the professional communication of non-language specialists. The scientist theoretically substantiated the pedagogical conditions for the formation of the principles and motives of self-education of future specialists in the process of learning. Also, the ways of forming communicative competence of future specialists and pedagogical conditions were considered by K. Kasiarum (2019). Communicative competence is defined as "based on knowledge and sensory experience, the ability of an individual to orient himself in situations of pedagogical communication in order to solve communicative tasks, the readiness to understand the motives and strategies of behavior of both his own and communication partners, the ability to carry out effective communication within the limits of business communication in order to solve professional tasks and the appropriate level of mastering communication technologies".

O. Shkurenko (2016), the state of the formation of professional-pedagogical communication was investigated, and the theoretical foundations of the formation of professional-pedagogical communication in the future primary school teacher were highlighted, which is presented as the main component of the professional training of the future specialist.

In turn, scientists A. Tsang, A. Paran & W. Lau (2023) in their articles consider the problem of the language and non-language benefits of literature in foreign language education. S. Marinov, M. Soulé & J. Cots (2021) examine the role of context, understood here as a site for social practices in particular settings, before and during study abroad in the development of students' plurilingual identities. In particular, we focus on different levels of contextual constraints and opportunities to which students who are non-language majors refer in semi-structured interviews.

Educators C. Nguyen & T. Nguyen (2020) in their work «Non-language-major students' autonomy in learning English in Vietnam» focus on the fact that the English language is one of the international languages used for communication and learning worldwide.

Interrogating the construct of communicative competence in language assessment contexts is considered by C. Elder, T. McNamara, H. Kim, J. Pill & T. Sato (2017). They emphasize that models of communicative competence in a second language invoked in defining the construct of widely used tests of communicative language ability have drawn largely on the work of language specialists. The risk of exclusive reliance on language expertise to conceptualize, design, and administer language tests is that test scores may carry meanings that are misaligned with the values of non-language specialists, that is, those without language expertise but perhaps with expert knowledge in the domain of concern. Neglect of the perspective of lay (i.e., non-linguistic) judges on language and communication is a serious validity concern, since they are the ultimate arbiters of what matters for effective communication in the relevant context of language use.

So, the scientists investigated the state of formation of professional-pedagogical communication, found out the ways of forming the communicative competence of future specialists and pedagogical conditions, and considered the need for a favorable social and communication space for quality education in general in the institution of higher education.
The study of the problem of the formation of professional communication of non-language specialists in higher education institutions requires consideration of this topical issue, taking into account modern trends in updating the methodology of complex formation of structural components of professional communication of non-language specialists, identifying pedagogical conditions for the effectiveness of the specified process.

The aim of the study. To conduct an experimental study with the aim of clarifying the existing level of formation of professional communication of non-language specialists in institutions of higher education and to show ways of forming their communicative competence, to single out shortcomings, the main factors affecting the insufficient development of professional communication of specialists of non-language specialties in institutions of higher education and to develop the necessary ways to overcome the insufficient development of the formation of professional communication in institutions of higher education.

Methodology

To achieve the goal, the following research methods were used in the research process:

- theoretical (analysis of methodical, psychological, pedagogical, philosophical literature, comparison, synthesis, modeling, generalization, systematization) made it possible to determine the structure of professional communication of non-language specialists in higher education institutions, the essence of the main research concepts;
- empirical (testing, pedagogical experiment, observation) made it possible to determine the level of formation of professional communication of non-language specialists in higher education institutions;
- mathematical statistics (quantitative and qualitative analysis of experimental data; verification of statistical hypotheses according to the Wilcoxon, Fisher, Pearson criteria) made it possible to prove the homogeneity of the control and experimental groups, to find correlations between the components of professional communication of non-language specialists, to show the reliability and significance of experimental data.

Experimental research base. The research was conducted during 2022-2023. 132 students of higher education were involved.

When determining the sample of subjects, the general specificity of the subject of the study was taken into account. The sample was formed by random selection using the technical procedure for calculating the selection step.

The research was carried out in two stages. The first stage included the analysis of psychological and pedagogical literature on the specified problem. Here, a diagnosis of the formation of professional communication of non-language specialists in institutions of higher education was carried out, with the aim of determining its level; The II stage included the development, research, and implementation of pedagogical conditions for the formation of professional communication of non-language specialists in higher education institutions.

The reliability and validity of the obtained results, and the objectivity of their assessment were ensured by the methodological soundness of the initial positions and the qualitative mechanism for evaluating the quality under study, the use of a complex of complementary research methods, and the involvement of a group of respondents from a higher educational institution in the analysis of its results.

To assess the homogeneity of experimental and control data, statistical processing was performed using MS Excel and SPSS (Statistical Package for Social Science).

Results and discussion

1. The content of the concept of "communication" in scientific literature.

The analysis of literary sources shows that the very term communication "highlights to the highest extent a complex and multifaceted phenomenon that permeates not only the social organism, but also operates outside the boundaries of society as such, that is, in nature."

The concept of "communication" is presented by scientists as:

1) connection of one place with another;
2) message path;
3) transmission from person to person of information carried out using language;
4) communication;
5) signaling methods of communication in animals.

The term "communication" still does not have a generally accepted definition. American researchers F. Dance and K. Larson did the calculations and found out that there are about 126 definitions of the term "communication". The emergence of the concept of "communication" in scientific literature is associated with the founder of American sociology, Charles Cooley, at the beginning of the 20th century. considered communication to be a mechanism by which the development of human relations, and the existence of society becomes possible, in his opinion, communication includes all symbols of the mind in space along with the methods of their transmission and preservation in time. Communication includes the latest achievements in conquering space and time, communication, facial expressions, gestures, words, tone of voice, printing, writing, and telephone. There is no clear line between the outside world and the means of communication. The system of standard symbols appears with the birth of the external world and is intended only for the transmission of thoughts. It is from it that the development of communication begins (Kozakov et al., 2017).

The most common is the understanding of the concept of communication, which "comes from the Latin *communicatio* – unity, transmission, connection, message related to the Latin verb *communico* – to make common, to communicate, to connect, derived from Lat. *communis* – common and is used today to denote the connection of any objects of the material and spiritual world. It also means communication, message, news, interaction, exchange of information in society, creation and dissemination of information, and means of communication (Calderón & Castillo, 2015).

The history of the formation of the scientific study and analysis of the concept of "communication" unfolds against the background of constantly changing real problems.

The idea of "division of labor" became the first theoretical step in substantiating the concept of "communication", which was formulated as a scientific hypothesis by the English scientist A. Smith (1723–1790), who believed that communication is a necessary prerequisite for any division of labor in any field , which makes it possible to structure economic activity by organizing collective work. "Communication", in his opinion, is unity, connection, transfer, message, message, exchange of information, interaction in society, a means of communication, distribution, and creation of information.

As a social phenomenon, the communication of any subject to the object expresses the unilinear orientation of the information influence, and the reaction or feedback of the object to the influence is not expected.

Therefore, the definition of the concepts of "communication" "can be grouped on three grounds: first, communication is considered as a connection between different objects. Such a non-categorical definition is characteristic mainly for the everyday understanding of communication. Secondly, communication is understood as an analogue of communication. Thirdly, communication is understood as an analogue of influence" (Kozakov et al., 2017).

2. Effectiveness of professional communication and communication space of non-language specialists in higher education institutions.

Professional communication of non-language specialists in institutions of higher education sets requirements for the teacher's personality qualities, which are specific. The most important requirement is communicativeness as a necessary prerequisite for active and successful work with pedagogical information of specialists in non-language specialties in institutions of higher education: information aimed at educating and training students of higher education (Álvarez Valencia & Michelson, 2023).

Communicative pedagogical professional activity of specialists of non-language majors in institutions of higher education is an activity with the help of which the teacher, through communication, organizes the exchange of information, transfers knowledge, manages the cognitive and practical activities of students of higher education, and regulates mutual relations between them (Haukås et al., 2022).

The higher the productivity of communication, the greater the number of means of perception and sources of information involved in a certain pedagogical situation. This happens because information is received not by one, but by different channels of perception: auditory, visual, and tactile.

Effective professional communication of specialists of non-language majors in institutions of higher education is the one that is productive in pedagogical communication – it is an interpersonal, equal interaction based on cooperation and dialogue, aimed at unifying the common efforts of subjects and their coordination for the purpose of individual satisfaction of each student of higher education and increasing the level of his activity in joint collective activities in the institution of higher education (Mukan et al., 2020).

3. Communication space and communication environment.

We consider the communication space of non-language specialists in higher education institutions as:

- an educational sphere in which, with the help of communications, information exchange is carried out;
- an educational space where the communicative process takes place;
- a system of communicative multiple connections between various communication agents, which can be represented by social institutions, groups of people, and individuals.

The communication space is characterized by the number of interactions, intensity, and distance between agents of communicative interaction. The structural basis of the communication space is the social and communication space of the institution of higher education. It appears in the form of a complex multi-element formation.

We understand the professional communication of any non-language specialist in a higher education institution as the exchange of educational information with the help of modern information and communication tools, and the exchange of documentation through certain communication channels.

Communication environment is not equivalent to communication space. Thus, students of higher education, existing in the same communication space, can move from one communication environment to another. Sometimes these environments are extremely heterogeneous, but the student of higher education perceives them as a single entity. Students of higher education can be simultaneously in different (for example, in the virtual reality communication environment) communication environments: computer games, communication on the Internet, etc.).

The communication space of non-language specialists in institutions of higher education acts as a basic institution for the creation of new communication models (Hernández-Jorge et al., 2022).

In the conditions of the activation of the information flow in institutions of higher education, the goal of the student's activity is the production, accumulation, distribution, and preservation of the entire amount of knowledge, regardless of the location of the user, providing various forms of access to them (Bilychenko, 2021).

One of the main tasks facing institutions of higher education is to provide the state with competitive specialists who have a high level of professional training. And the formation of professionally significant communication skills and abilities in future specialists is one of the main trends in improving the educational process. It is difficult to overestimate the role of communication in the professional activity of non-language specialists. Effective professional communication of a non-linguistic specialist is the basis of the successful activity of a modern person. The professionalism of a specialist depends primarily on his style of communication, communicative qualities, integral sensitivity to the object of communication, the power of influence on the behavior of other people, and the process and result of professional activity. Through the actions of the individual, the communicative side of communication is manifested, it is through the actions that conscious orientation to their meaningful perception by other people takes place. It is not just the movement of information that occurs in the communicative process, but also an active exchange of it, in which the significance of one or another message plays the main role. In the training of a specialist, the formation of competent communication skills is important. The professional or scientific literacy of a specialist is inevitably reflected in the attitude towards the specialist of all who communicate with him. And the future of a specialist depends on the ability to communicate in a professional environment.

Academic literacy is also important, which is achieved with the help of the comprehensive development of the system of certain skills in the learning process. The level of academic literacy serves as a criterion that determines a specialist's readiness for training, advanced training, and scientific work.

Stages and factors of studying scientific sources of information.

The task of higher education institutions in order to form professional communication of non-language specialists is to provide the future specialist with the tools to work with literature, quickly understand its structure, correctly record and evaluate in a convenient form everything that seems necessary and interesting for conducting scientific research.

The stages of studying scientific sources of information can be divided into:

– general introduction;
– reviewing the selected literature;
– in accordance with the order of study, the content of the work, systematization and processing of scientific sources of information;
– according to the sequence of placement of study material and reading of scientific sources of information;
– selective reading of individual parts of scientific sources of information;
– for the purpose of forming the text of a scientific research paper, writing out the necessary material by students;
– final recording and editing in the form of a fragment of the text of a scientific work (term (master's) work, article, dissertation, monograph, etc.).
– critical assessment of what has been recorded. It is worth selecting only scientific facts in the process of processing the sources of specialized literature (Yemelyanova et al., 2022).

Therefore, the need for the formation of professional communication of non-language specialists in institutions of higher education is determined by the following factors:

1) professional communication of specialists is a prerequisite for successful activity;
2) the importance of specialist training in modern conditions is growing;
3) professional communication of non-language specialists is a necessary component of self-improvement and self-realization of an individual (Bielikova et al., 2016).

4. Division of communications at the level of a higher education institution.

We define the communication space of a student of higher education as a communication system of groups that have different values, statuses, functions, and needs. In the institution of higher education, communication is divided into levels. The first level is students of higher education and teachers who communicate in classrooms, carrying out a constant process of knowledge transfer.

The second level is deans and students of higher education, students of higher education and the control room, deans – control room – teachers who carry out the process of organizing the transfer of knowledge).

The third level is teachers – the management of faculties, departments – the rectory, which contribute to the definition of educational technologies and their content.

The fourth level of communication is the rectorate – the ministry.

Professional communication of non-language specialists in higher education institutions ensures the movement of educational information in space and time with the help of documentation in paper form and in digital form, thanks to the constant development and modernization of new information and communication technologies. Integrating into the global information space, modern institutions of higher education cannot be competitive and effective without offering their educational services in the international information space. At present, in institutions of higher education, one of the most important places in the improvement and formation of the educational process is occupied by communication. Social and communication processes, which are global, actively influence the processes of exchange of scientific, educational, educational information, in the entire field of education, not only between students of higher education and teachers within the framework of one institution of higher education, but also by involving others in the exchange.

5. The structure of professional communication of non-language specialists in institutions of higher education.

The structure of professional communication of non-linguistic specialists in institutions of higher education includes the following two main components: educational space and communication environment, within which digital structures and communication processes ensure the purposeful circulation of professional knowledge and social information in the space-time continuum of society.

The study of the digital component between system elements in a higher education institution reveals the following functional properties:

- ensuring the process of exchange and transmission of educational scientific information;
- the ability to be a channel of formation, accumulation, collection, and distribution of information in space and time;
- the existence of a material medium that affects the process of transmitting educational information in space and time;
- the ability to be the result and means of educational activity;
- support and provision of socialization processes;
- promotion of the innovative process of formation of new knowledge;
- directing information, with the aim of ensuring the use of information and communication technologies.

In the communication space of the institution of higher education, the following four main subjects with their own status, values, and interests function: the state, the administration of the institution of higher education, students of higher education, and teachers (Bilychenko, 2021).

The components of pedagogical optimal communication in institutions of higher education are:

- the high authority of the teacher, their respect and love for higher education seekers, and the mutual return of the student, which is the most important condition for the success of pedagogical communication, the entire educational process of the higher school;
- techniques of communication and the human psyche, the teacher must be trained as a practical psychologist;
- experience accumulated in everyday practice, which includes skill and mastery (Vakulyk et al., 2022).

6. Experimental study.

Based on the fact that effective communication is interpersonal, equal, interaction that is productive in pedagogical communication and is based on cooperation and dialogue, aimed at unifying and coordinating the common efforts of higher education seekers for the individual satisfaction of everyone in joint collective activities and in order to increase the level of their activity (Kuchai et al., 2018) we conducted research during 2022-2023. 432 students of higher education were involved.

The research was carried out in two stages.

The first stage included the analysis of psychological and pedagogical literature on the specified problem. Here, a diagnosis of the formation of professional communication of non-language specialists in institutions of higher education was carried out, with the aim of determining its level.

The II stage included the development, research, and implementation of pedagogical conditions for the formation of professional communication of non-language specialists in higher education institutions, which we singled out as the most effective:

- formation of motivation of future specialists through a series of heuristic conversations for communicative activity in the process of professional training;
- step-by-step design of the content of the formation of professional communication of non-language specialists in institutions of higher education based on integrative and systemic approaches by introducing communicative blocks into professional disciplines and integrating and harmonizing communication-oriented disciplines;
- application of the method of formation of professional communication of non-language specialists in institutions of higher education with the use of information technologies through the organization of independent work of students, development of informational and methodological support.

- involvement of future specialists in communicative activities during the mastering of professional disciplines;
- development of a complex of communicative situational training.

We took into account that in order to conduct an experiment, the selection of the base must meet the requirement: all elements of the population must have the same chance of being included in the population of the sample.

Questionnaires, interviews, and surveys were conducted among students of higher education in the 3rd and 4th years of bachelor's degrees.

The purpose of the declarative experiment was to determine the essence of the problem, to determine the purpose of the study, to find out the existing level of formation of professional communication of specialists of non-language specialties in institutions of higher education, to single out shortcomings in the formation of professional communication of specialists of non-language specialties in institutions of higher education.

The necessary groups for the experiment were chosen so that they were sufficiently representative from the point of view of the goals of the experiment.

During the survey, applicants for higher education were asked several questions:

1. Define communication.
2. Describe the essence of professional communication of specialists.
3. Name the types of communication that should be used in professional activities.
4. How does communication knowledge affect the development of pedagogical skills?

We made the following conclusions after analyzing the results of the survey:

- students were able to define the term "communication" or "pedagogical communication": EG – 19%; CG – 17%;
- the essence of professional communication of specialists was revealed by: EG – 22%, CG – 24% of respondents;
- showed communication knowledge that affects the development of pedagogical skills, highlighted the types of communication that should be used in professional activity by 17% of respondents;
- respondents claimed that knowledge of the theoretical foundations of communication will significantly affect the pedagogical skill of a specialist (EG – 29%; CG – 30%). During the experiment, it was found that the majority of respondents experienced problems when conducting training and simulation classes, did not have the means of communication (EG – 31%; CG – 32%);
- only 18% of students showed good communication skills and abilities, but they had problems due to their small vocabulary;
- a large number of higher education students use slangisms, dialects, etc. in their vocabulary (EG – 32%; CG – 33%).

The research conducted in institutions of higher education proved that the future specialists of non-language majors have insufficiently developed skills to formulate the purpose of future activity, professional communication skills, reasonableness, and expediency of professional communication; respondents cannot effectively organize the educational process, and form communicative situations.

The main factors affecting the insufficient development of professional communication of non-language specialists in institutions of higher education were determined according to the results of the questionnaire:

- insufficient number of literary sources in institutions of higher education for mastering the practical skills of professional communication of non-language specialists;
- lack of theoretical knowledge of non-language specialists on communication problems;
- low level of practical skills and experience of non-language specialists in the application of professional communication in practice.

7. Ways to overcome insufficient development of professional communication skills of non-language specialists in higher education institutions.

Having identified the main shortcomings and factors that affect the insufficient development of the professional communication of non-language specialists in higher education institutions, we offer ways to overcome this problem.

When training future specialists, you should:

- emphasize the creation of conditions for interaction;
- to encourage higher education seekers;
- direct the educational space to the development of cooperation skills, to collective work where it is appropriate in a collective and informational environment.

This path, in the further professional activity of each specialist, contributes to learning to cooperate in the conditions of using communication tools for various activities.

In order to find out the state of understanding of the importance and necessity of the formation of professional communication of specialists of non-language specialties in institutions of higher education and to conduct an ascertaining experiment among students of higher education, we systematically conducted training seminars on mastering innovative technologies by future specialists. At such seminars, it is envisaged to find out the state of the use of innovative technologies in the educational space and prepare specialists to conduct practical training using interactive technologies.

8. Diagnosing the communicative competence of future specialists of non-language majors in institutions of higher education.

The analysis of scientific works and the real state of formation of professional communication of non-language specialists in institutions of higher education made it possible to identify: systemic problems, in particular, the lack of methodological recommendations with a full, versatile consideration of all types of communicative activity and an explanation of its importance in professional activity; lack of methodological focus on the formation of components of communicative competence during the study of professional disciplines, etc.
Recognition of the need to develop the communicative competence of non-language specialists in institutions of higher education has a declarative rather than an applied nature. Diagnostics of communicative training of future specialists of non-language majors in institutions of higher education revealed that only 6.8% of respondents have a high level of communicative competence, 35.6% have an average level, and 57.5% have a low level of communicative competence, which indicates problems in their professional preparation for future communicative activities.

9. The structure of communicative competence of future specialists in non-language majors.

The study determined the structure of the communicative competence of future non-language specialists according to the structure of communicative activity:

The motivational and value component of the communicative competence of future specialists in non-language specialties involves the formation of motivation for foreign language communication of professional value; motivation for communication as a universal human value; and motivation as the ability to motivate others to general and professional communication.

The cognitive-strategic component of the communicative competence of future specialists in non-language specialties includes: knowledge of the main sections of professional disciplines; knowledge of non-verbal communication; knowledge of symbolic communication; and knowledge of a technical nature to ensure the information and technical component of communicative activity.

The activity-corrective component of the communicative competence of future specialists of non-language specialties based on a complex system of motivation of communicative potential is a practical manifestation in communicative activity of knowledge of non-verbal, verbal, information-technological, symbolic-symbolic, emotional-sensual components of communicative activity.

The criteria of communicative competence of future agrarian managers are defined as: motivational; cognitive; active.

The method of complex formation of structural components of communicative competence (motivational-value, cognitive-strategic, activity-corrective) of future specialists in non-language specialties with the use of information technologies involves: the use of conversations; portfolio, micro situation analysis methods, communicative blocks, round table; video method, case study, business game methods, psychological training, etc.

A great positive influence on the method of complex formation of structural components of communicative competence is observed in the use of information technologies YouTube, E-mail, Skype, and the author's blog for the formation of all components of communicative competence of future specialists of non-language specialties.

The complexity of forming the structural components of the communicative competence of future specialists in non-language specialties lies in the focus of the methodology on all components, taking into account their features, and on achieving the overall goal – the formation of communicative competence.

The effectiveness of pedagogical conditions for the formation of communicative competence of future specialists in non-language specialties was confirmed during the pedagogical experiment. We determined the control and experimental groups, taking into account validity and integrity. At the formative stage of the experiment, to determine the actual level of formation of individual components of the communicative competence of future specialists in non-language specialties, a diagnostic study was conducted using the author's method of diagnosing the levels of formation of components: cognitive-strategic, motivational-value, activity-corrective. The correlations between the components of competence in the control and experimental groups, and the dynamics of changes in the levels of communicative competence were studied. It was found that the implementation of the specified pedagogical conditions gave the following results at the formative stage of the experiment:

– compared to the level of the control group – 9.3% we observe an increase in the level of communicative competence of the experimental group;
– the number of respondents with a high level is 8.7% higher in the experimental group compared to the control group;
– compared to the control group, we observe a 26.1% lower number of respondents with a low level than in the experimental group;
– the average number of respondents in the experimental group is 17.4% higher than in the control group.

We believe that the increase in the number of future specialists in non-language specialties with a high and medium level and a significant decrease in the number of respondents with a low level of communicative competence is significant. This is a particularly important result. The study showed that: the sample distributions obtained in the experimental and control groups are subject to a normal distribution, that is, the experimental values are not random.

The significance of the differences between the results of the experimental and control groups was determined using the Fisher distribution and the Pearson test. The homogeneity of these groups was proven using the Wilcoxon test.

Correlations were established between the components of communicative competence. It was found that the correlation coefficient between them is in the range of 0.75 – 0.8.

Between 0.6 and 0.8 is the correlation coefficient between the levels of motivation for communication. It turned out to be the closest correlation between the communication motivation of future specialists in non-language specialties as a universal human value and communication motivation.

The effectiveness of the formation of communicative competence of future specialists in non-language specialties was proven by our experiment through the implementation of the developed pedagogical conditions.

If the ascertaining stage of the experiment indicated the low effectiveness of the professional training of future specialists of non-language majors for their future professional communicative activities:

– 6.9% of future non-language specialists had a high level of communicative competence;
– 57.5% of future specialists in non-language specialties had a low level.

So, the results of the formative stage of the experiment are as follows:

– 16.5% of the respondents in the experimental group have a high level of communicative competence,
– 52.5% of future specialists in non-language majors have an average level,
– 31% – low level;

10. Rules of pedagogical communication for future specialists of non-language majors.

As a result of the study, the rules of pedagogical communication for future specialists of non-language majors have been identified, which will enable those seeking higher education to avoid many mistakes in their professional activities (Chagovets et al., 2020):

- take into account in professional activities that success in work always depends on the culture of communication;
- model communication based on the needs and interests of colleagues, not "from yourself";
- take into account the psychological state of an individual and the team as a whole;
- focus your speech on a specific person, and not on an abstract group of people;
- use different types of communication;
- enter into communication with the individual, organize it based on mutual interests, and not from top to bottom;
- consider the opinion of the interlocutor, be able to listen to colleagues;
- do not degrade the human dignity of the interlocutor;
- try to understand the mood of the interlocutors by organizing communication, and modeling communication with them;
- analyze your actions and deeds, look at yourself from the side;
- communication should prevent conflicts, not lead to them;
- take into account the gender of the interlocutor in the communication process;
- communication between interlocutors should be systematic;
- keep the initiative of communicating with interlocutors in your own hands;
- constantly look for means, new forms, techniques, and methods, avoid stereotypes in communication;
- smile as often as possible to the interlocutor: it encourages productive communication, gives positive emotions;
- in relation to a specific interlocutor, overcome negative attitudes;
- avoid abstract criticism of the interlocutor in the process of communication;
- strive for encouragement and approval in the process of your communication with interlocutors;
- keep the course of the situation in mind, develop your communicative memory;
- openly express your attitude to interlocutors in the team;
- develop the course and plan of the conversation in advance, if there is a need for an individual conversation with the interlocutor;
- systematically analyze the communication process;
- the center of attention of the communication process should be the personality of the interlocutor, his dignity;
- take into account the socio-psychological growth of the interlocutor;
- think over the peculiarities of communication and its course with problematic interlocutors;
- in the process of communication, take into account the individual characteristics of the interlocutor, the manifestation of his character, temperament;
- constantly improve your own speech – a communication tool.

Conclusions

The study reveals the meaning of the concept of "communication" in scientific literature, and shows the effectiveness of professional communication and the communication space of non-language specialists in higher education institutions.

We consider the communication space of non-language specialists in higher education institutions as: an educational sphere, an educational space, a system of numerous communicative connections between various communication agents. The stages and factors of the study of scientific sources of information are singled out, the division of communications at the level of a higher education institution is made, and the structure of professional communication of non-linguistic specialists in higher education institutions is disclosed.

The experimental research (ascertainment stage) made it possible to find out the existing level of formation of professional communication of non-language specialists in institutions of higher education, to single out shortcomings in the formation of professional communication of specialists, to single out the main factors affecting the insufficient development of professional communication of specialists in non-language specialties in institutions of higher education education Ways to overcome the insufficient development of professional communication skills of non-language specialists in higher education institutions have been developed.

Diagnosing the communicative competence of future specialists in non-language majors in higher education institutions was carried out. and the structure of communicative competence is shown. At the formative stage of the experiment, to determine the actual level of formation of individual components of the communicative competence of future specialists in non-language specialties, a diagnostic study was conducted with the help of diagnosing the levels of formation of components: cognitive-strategic, motivational-value, activity-corrective. The effectiveness of the formation of communicative competence of future specialists in non-language specialties was proven by our experiment.

The rules of pedagogical communication for future specialists of non-language specialties have been developed.

Further research will be directed at the emerging features of the social and communication space of higher education institutions.

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Policy for the formation of social consciousness during students training in educational institutions: pedagogical aspect

Política para la formación de la conciencia social durante la formación de estudiantes en instituciones educativas: aspecto pedagógico

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Abstract

This article analyzes and proposes improvements to the policy of developing social consciousness during training in higher educational institutions. Furthermore, it focuses on the pedagogical aspect of this issue. Developing social consciousness is crucial in shaping modern specialists. These specialists must possess not only developed practical and theoretical professional skills, but also a high level of empathy and social awareness. The research employs the IDEF0 functional modeling method, a novel approach that goes beyond simply listing key stages. Instead, it demonstrates the place and role of additional elements within the process. As a result, a model system for enhancing the policy of developing social consciousness in higher education institutions was formed. The study acknowledges a limitation: it solely

Resumen

Este artículo analiza y propone mejoras a la política de desarrollo de la conciencia social durante la formación en instituciones de educación superior. Además, se centra en el aspecto pedagógico de esta cuestión. Desarrollar la conciencia social es crucial para formar a los especialistas modernos. Estos especialistas deben poseer no sólo habilidades profesionales prácticas y teóricas desarrolladas, sino también un alto nivel de empatía y conciencia social. La investigación emplea el método de modelado funcional IDEF0, un enfoque novedoso que va más allá de simplemente enumerar etapas clave. Más bien, demuestra el lugar y el papel de elementos adicionales dentro del proceso. Como resultado, se formó un sistema modelo para mejorar la política de desarrollo de la conciencia social en las instituciones de educación superior. El estudio

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considers processes for improving pedagogical methods among students with a pedagogical profile. Future research plans to expand this study to encompass other higher education institutions.

Keywords: Social consciousness, higher educational institutions, education, functional modeling, pedagogy.

reconoce una limitación: considera únicamente procesos de mejora de métodos pedagógicos entre estudiantes con perfil pedagógico. La investigación futura planea ampliar este estudio para abarcar otras instituciones de educación superior.

Palabras clave: Conciencia social, instituciones de educación superior, educación, modelamiento funcional, pedagogía.

Introduction

The modern world faces challenges that require educational systems not only to transfer knowledge, but also to form the social consciousness of the younger generation. Policies for the formation of social consciousness in educational institutions play a key role in preparing students for life in a modern society characterized by rapid change, globalization and information openness.

The pedagogical aspect of this policy involves the involvement of educational specialists in an active dialogue with students, the use of innovative teaching methods and critical thinking. This not only contributes to the growth of students' personal potential, but also forms a deep understanding of social processes and their role in society.

The importance of the policy of forming social consciousness in education cannot be underestimated. It helps young people develop their views, critically analyze information and develop personal values that meet the requirements of a modern democratic society. An important component of this policy is an understanding of the role of education in the formation of active citizens who are capable of not only adapting to changes, but also being their initiators. Teachers must play a critical role in this process by encouraging students to achieve self-realization and self-expression.

The process of creating social consciousness in educational institutions also includes raising students' awareness of contemporary social challenges such as inequality, climate change and human rights. Such education helps young people understand the complexity of these problems and develop responsible attitudes towards them.

Integrating an interdisciplinary approach into the educational process helps broaden students' horizons and develop their analytical skills. This allows them to see connections between different areas of knowledge and understand how social, economic and political factors are interrelated. An effective policy for the formation of social consciousness in education requires the active participation of students in the learning process. This may include projects that address real-life social problems, which not only develops critical thinking skills, but also encourages social activism and responsibility.

One of the main problems in the formation of social consciousness in educational institutions is the lack of consistency and unity in approaches. Often educational policies and practices are developed without taking into account the variables of social, cultural and economic contexts. This leads to a situation where curricula do not reflect the current challenges and needs of society, and teachers do not always have the necessary resources or training to teach effectively in such conditions.

In conclusion, the policy of developing social consciousness in educational institutions is an integral part of preparing young people for life in the modern world. It promotes the development of informed, responsible and active citizens who are able to understand and influence the world around them.

The purpose of the article is to analyze and improve the policy of formation of social consciousness during training in higher educational institutions. At the same time, the research aspect is focused on the pedagogical aspect of this issue. The object of the study is the system of pedagogical training of students, within the framework of which the development of social consciousness occurs.

The structure of the article consists of an introduction, a literature review, a methodology section, results, discussions and conclusions.

Literature review

A detailed literature review is key to scientific research as it provides the foundation for an in-depth understanding of the topic and context of study. A detailed analysis of existing research, theories and approaches allows not only to identify the current state of science in the chosen field, but also to identify gaps in knowledge and new opportunities for further research. This is especially important in the context of our study, which focuses on the policy of developing social consciousness in education in higher education institutions, since this topic involves multifaceted aspects of social sciences, psychology, pedagogy and educational policy. A literature review provides valuable information and insights that will help in preparing a balanced and informed analysis of the issues under study.

So, Bilan et al. (2017) in their work analyze the relationship between human capital factors and compensation by modeling the impact. This research may be particularly useful for understanding how educational policies can shape social consciousness in terms of reward and motivation in the context of higher education.

In turn, Martínez-Valdivia et al. (2020) note in their work the importance of social responsibility and the preparation of university teachers. This study is important for understanding how higher education teacher training influences the development of students' social consciousness.

Bathmaker et al. (2013) in their study focus on the influence of social class in the context of higher education and how students of different social classes mobilize their capital for success in higher education. This study is of great importance for understanding the processes of formation of social consciousness, since it points to the importance of understanding social inequalities in the educational environment.

Pasinringi et al. (2022) highlights the importance of social support for college students' mental health. This aspect is key in the formation of social consciousness, since mental health is closely related to the ability of students to actively participate in social life and educational processes.

In turn, Biasutti et al. (2019)'s study examines social sustainability and professional development through an evaluation of an intercultural education course for in-service teachers. This study is important for understanding the effectiveness of pedagogical methods in developing social consciousness, especially in the context of cultural diversity.

An interesting study by Kalsoom et al. (2017), who focus on developing sustainability consciousness among future teachers around the world. Thus, this study analyzes the question of how future teachers perceive and integrate the concepts of sustainable development into their educational practices, which are a key aspect of the formation of social consciousness.

The work of Ochirov (2016) focuses on developing the professional competence of future primary school teachers through teaching practice. This study is important for understanding how practical experiences during teaching can influence teachers' ability to shape the social consciousness of their students.

Wamsler's (2020) study sees sustainability education as a means of stimulating a more conscious society and transformation towards sustainability. The scientist's research focuses on the importance of integrating the principles of sustainable development into the educational process, which is key to the formation of social consciousness.

Work by Roth et al. (2020) discusses educational philosophy in a new way, focusing on limitations and opportunities in modern conditions, particularly in the context of dignity. This study highlights the importance of reflection and critical thinking in developing social consciousness in education.

Research by Mahmud et al. (2020) presents mathematical modeling of social consciousness to control the spread of COVID-19. This study demonstrates the importance of social awareness in the context of global challenges, as well as the importance of integrating scientific approaches to understanding social processes.

Interesting in the context of our chosen topic is the work of Chang Zhu (2015), which analyzes the influence of organizational culture on innovation supported by technology in higher education. This study is important for understanding how organizational aspects can influence the adoption and effectiveness of technological innovation in higher education institutions, which is key to the formation of social consciousness.

The impact of organizational culture on the adoption of technological innovations in education points to the potential of technology in enhancing social consciousness. Educational institutions should embrace a culture of innovation, utilizing technology not only to improve pedagogical outcomes but also to engage students in discussions and actions related to social issues and solutions.

In essence, these implications from the literature review call for a holistic and integrated approach to education that places a strong emphasis on developing social consciousness among students. This involves not only curricular changes but also systemic and cultural shifts within educational institutions, aiming to prepare students not just for professional success but also to be active, socially responsible citizens in a globalized world. In conclusion, the implications of this literature review for educational practice are profound and far-reaching. By integrating these insights into educational policies and curricula, institutions can play a pivotal role in shaping socially conscious citizens who are equipped to address and contribute positively to societal challenges. This requires a holistic approach that encompasses the development of human capital, social responsibility, equity, mental health support, appreciation for diversity, sustainable practices, reflective thinking, and technological innovation within the educational landscape. Lets build table that summarizes previous studies (table 1).

Table 1.
Literature review and summarizes previous studies

Authors	Year	Methodology	Results	Limitations
Bathmaker, A-M. et al.	2013	Qualitative analysis	Identified how students from different social classes mobilize their capitals for success in higher education	The study is context-specific and may not be generalizable to all educational settings
Bilan, Y. et al.	2017	Quantitative analysis, modeling	Analyzed relations and modeled the influence of human capital factors on remuneration, providing insights into educational policy implications	Limited by the specific economic and cultural context in which the study was conducted
Biasutti M, Concina E, et al.	2019	Evaluation of an intercultural education course	Showed positive outcomes on social sustainability and professional development for in-service teachers	Focuses on a single course, raising questions about the applicability to other contexts or disciplines
Chang Zhu	2015	Literature review and analysis	Highlighted the influence of organizational culture on technology-enhanced innovation in higher education	The study's conclusions are drawn from literature review, which may not capture the complexity of real-world educational environments
Kalsoom, Q. et al.	2017	Survey	Examined sustainability consciousness among future teachers, revealing awareness and integration of sustainable development concepts	The focus on pre-service teachers in Pakistan limits the study's generalizability
Martínez-Valdivia E et al.	2020	Qualitative analysis	Emphasized the importance of social responsibility in university teacher training for fostering commitment and social justice in schools	Limited to the context of the specific educational systems and cultures studied
Mahmud, M. S. et al.	2020	Mathematical modeling	Presented a model predicting the role of social consciousness in controlling COVID-19 infection spread	The model's assumptions and parameters may not fully capture the complexities of real-world social behavior

Ochirov, G.	2016	Qualitative case study	Discussed the development of professional competence in future primary school teachers through teaching practice	The findings are based on a limited sample, potentially affecting their broader applicability
Pasinringi, M. et al.	2022	Correlational study	Identified the relationship between social support and mental health in students, underscoring the importance of social support systems	The study is specific to emerging adulthood and may not represent other age groups
Roth K. et al.	2022	Philosophical inquiry	Explored educational philosophy with a focus on dignity, highlighting reflection and critical thinking in social consciousness development	The theoretical nature of the study may limit its direct application to practical educational settings
Wamsler Ch.	2020	Qualitative analysis	Discussed how sustainability education can stimulate a more conscious society and contribute to sustainability transformation	The study's scope is limited to sustainability education, which may not cover all aspects of social consciousness development

Source: (formed by authors)

Table 2 shows the key gaps in the current literature of the issue of forming social consciousness during preparation in higher educational institutions.

Table 2.
Key gaps in the current literature of the issue of forming social consciousness during preparation in higher educational institutions

Key gap	Essence of the gap
Insufficient analysis of the interaction between teaching methods and sociocultural factors	Much of the literature has focused on general teaching strategies without a deep understanding of how social and cultural factors influence the effectiveness of these methods. There is a need for research that specifically examines how different social conditions, cultural backgrounds, and individual characteristics of students influence the process of developing social consciousness.
Limitations in the study of the impact of technological innovation on social consciousness	In the modern world, technology plays a key role in the educational process, but the literature often does not take into account how the latest technological tools influence the formation of social consciousness. This concerns both the use of digital learning tools and the influence of social media and other online platforms on students' perceptions and values.
Lack of research on the long-term impact of educational initiatives on social consciousness	Often, research focuses on the short-term results of educational programs, ignoring the long-term impact of these initiatives on students. This creates a gap in understanding how educational experiences shape the social attitudes and behavior of graduates in the future
Lack of attention to individualized learning approaches	Most research in this area has ignored the importance of individualized learning approaches. Taking into account the individual characteristics of students, their needs and social contexts can significantly improve the process of forming social consciousness, but this aspect often remains underestimated in modern research.

Source: (formed by authors)

Summarizing the literature review, we can draw an important conclusion that, despite the significant amount of existing research in the field of the formation of social consciousness in the context of higher education, today there are still significant gaps and shortcomings in this area. Many aspects, in particular the connection between pedagogical methods and real changes in the social consciousness of students, require additional research and deeper analysis. This indicates the need to continue scientific research in this area, with an emphasis on identifying and filling these gaps, which will ensure a more effective formation of social consciousness in the educational process.

Methodology

Entering an era of innovation and complex social challenges, the use of innovative modeling methods in scientific research is of particular relevance. This is especially important in the field of educational policy, where the complexity and versatility of processes requires in-depth analysis and a systematic approach. Innovative modeling techniques make it possible to visualize and structure these processes, providing better understanding and effective planning. For our research, we chose the IDEF0 method, which is one of the most effective tools for modeling business processes and systems. This method is based on the creation of functional models that help describe and analyze complex processes and interactions in organizational structures.

The essence of the IDEF0 method is to develop diagrams that reflect the functional relationships within the system. Each diagram consists of boxes representing individual functions and arrows showing the flow of data, resources, or control between those functions. This provides a clear visual representation of processes and identifies key system elements.

One of the main advantages of the IDEF0 method is its flexibility and ability to adapt to different types of studies. In the context of the formation of social consciousness in educational institutions, this method allows for detailed analysis and optimization of processes, ensuring effective interaction of various components of the educational system. Regarding the component parts of a method, IDEF0 has four main components: the functions to be performed; inputs that define the resources needed for operation; outputs representing the results of functions; and mechanisms that describe how functions will be performed. This allows complex systems to be decomposed into simpler and more understandable components.

However, there are certain disadvantages in using the IDEF0 method, in particular its limited ability to reflect the dynamic aspects of processes. The method focuses on the static structure of the system and does not always adequately convey the changes that occur during its operation.

In addition, to effectively use IDEF0, you must have a deep understanding of modeling and knowledge of the specifics of the field being studied. This can be a barrier for those using this method for the first time and also requires additional time to prepare and analyze models. Overall, the IDEF0 method is a powerful tool for process analysis and optimization in our study, although it requires careful consideration of its specific features and limitations.

Figure 1 shows the key components of the method we have chosen in the context of the issue of forming social consciousness during preparation in higher educational institutions.

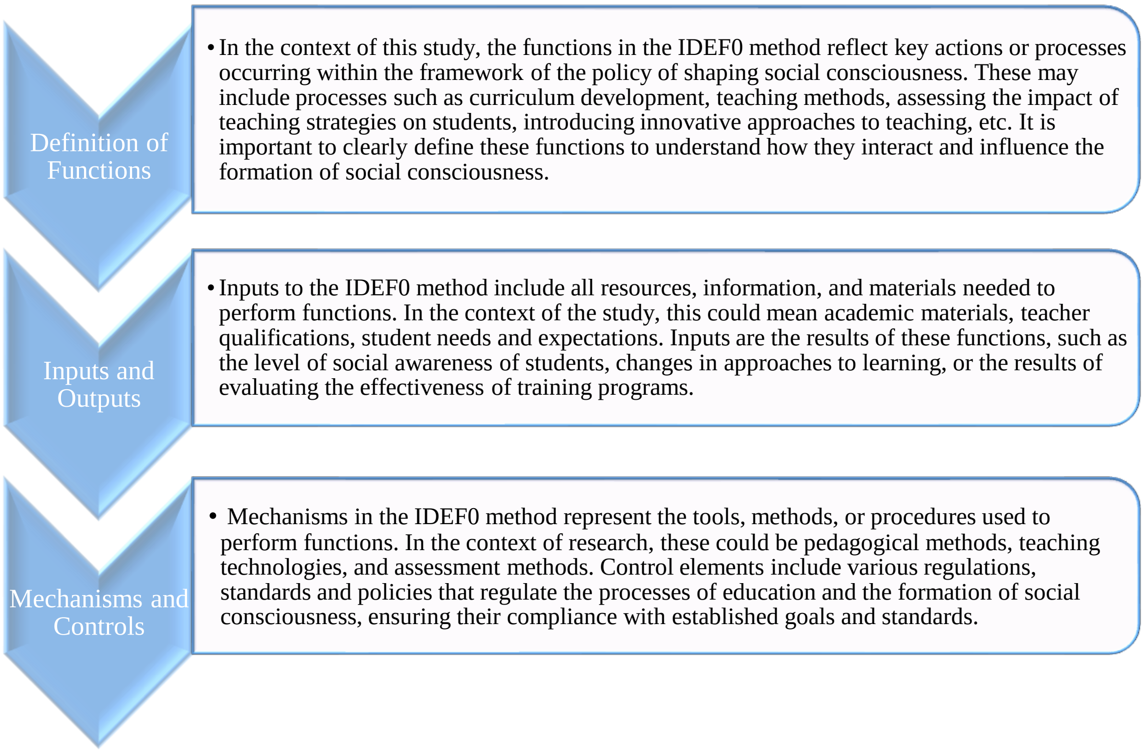

Figure 1. The key components of the chosen method in the context of the issue of forming social consciousness during preparation in higher educational institutions
Source: (formed by authors)

Based on the analysis and application of the IDEF0 method within the framework of our study, we can conclude that this method is optimal for studying the policy of forming social consciousness in higher educational institutions in terms of the pedagogical aspect. Its systematic and structured approach allows you to effectively visualize and analyze complex processes and interactions, which is necessary for a deep understanding of the dynamics and influence of pedagogical strategies on the formation of social consciousness. Due to its flexibility and ability to adapt to the specific conditions and needs of a particular study, the IDEF0 method becomes an important tool in the development and optimization of policies and programs in the educational field.

The selection process aimed at identifying educational institutions with pedagogical programs, given the study's focus on pedagogical methods. Criteria for selection included institutions that have implemented initiatives aimed at developing social consciousness, as well as a willingness to participate in the study. The rationale for focusing on students with a pedagogical profile is to explore the effectiveness of specific pedagogical strategies in cultivating social awareness. The methodology's reliance on a specific modeling method (IDEF0) and the focus on pedagogical programs might limit the generalizability of the results to other contexts or educational strategies.

Results and discussion

The first stage of the methodology we have chosen will be the use of the goal tree method, which will be based on identifying the key stages of improving the policy for the formation of social consciousness during training in educational institutions in the context of the pedagogical aspect (Fig.2).

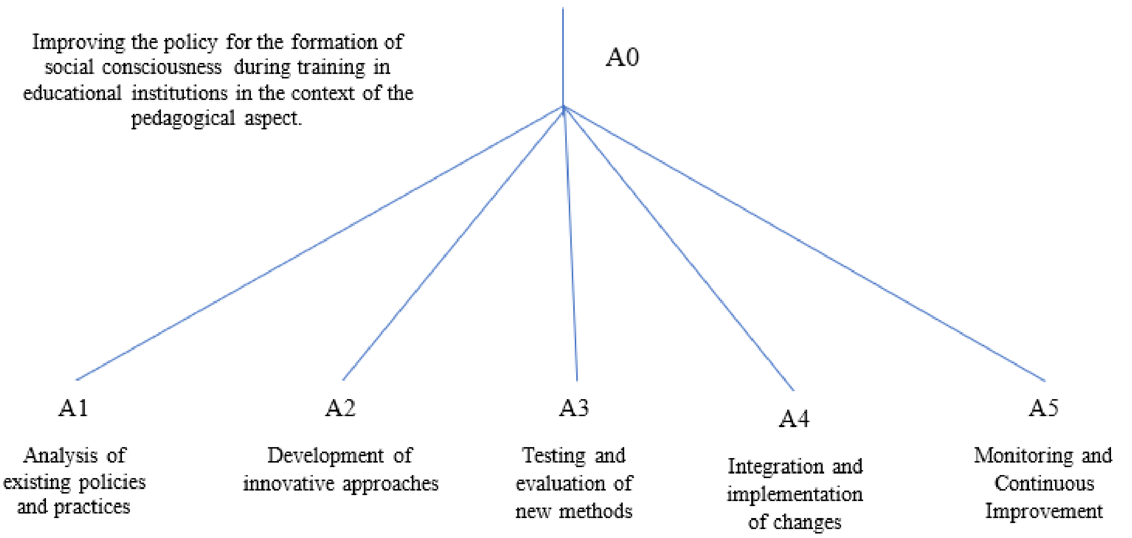

Figure 2. The goal tree model of the key stages of improving the policy for the formation of social consciousness during training in educational institutions in the context of the pedagogical aspect
Source: (formed by authors)

Thus, Fig. 2 shows a tree of goals, which is a hierarchical structure that includes main strategic goals, intermediate tasks and specific actions at each stage. This tool allows us to clearly define not only the ultimate goals of developing social consciousness, but also detailed ways to achieve them, including analysis of current policies, development of innovative approaches, testing and evaluation of new methods, their integration and continuous monitoring for improvement.

The next key element of the chosen methodology is the "black box" method, in the context of which the key basic and auxiliary elements of the final model will be determined (Fig. 3).

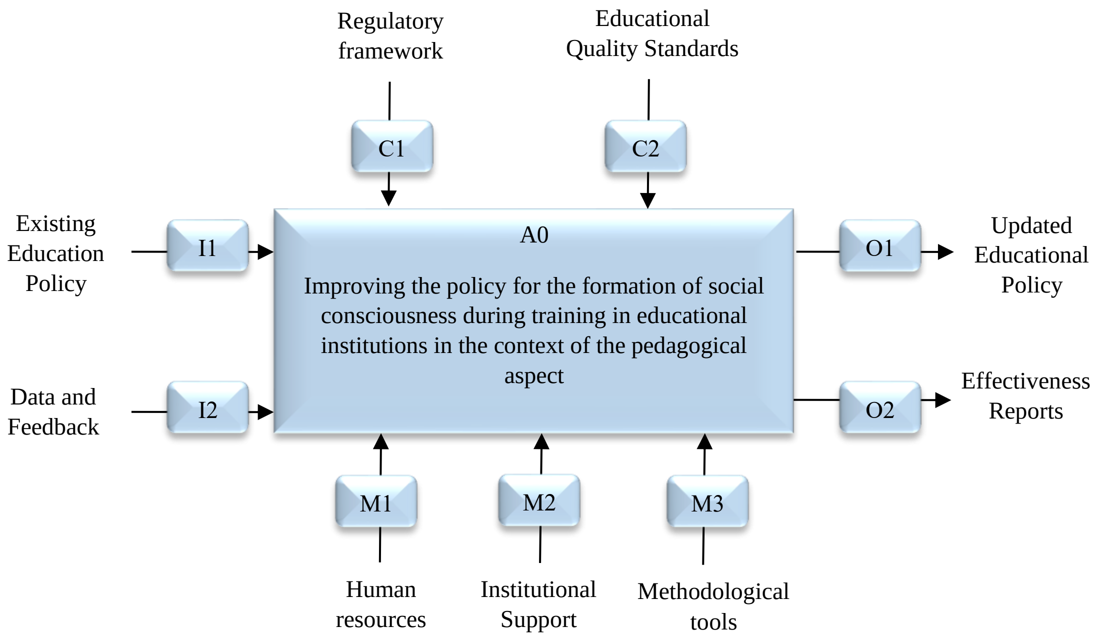

Figure 3. The "black box" model of the key basic and auxiliary elements in process of improving the policy for the formation of social consciousness during training in educational institutions in the context of the pedagogical aspect
Source: (formed by authors)

Let's take a closer look at each element:

Mechanisms (M):

- M1 (Human resources). Teachers, educators, educational administrators working on the development and implementation of educational programs.
- M2 (Institutional support). Educational governance structures, such as ministries of education, university councils and other education authorities, providing the necessary resources, political support and strategic guidance to introduce and support innovative pedagogical approaches and policies.
- M3 (Methodological tools). tools for analysis, evaluation and implementation of educational innovations, including technology platforms.

Inputs (I):

- I1 (Existing Education Policy). Current policies and practices requiring analysis and improvement.
- I2 (Data and Feedback). Information about the effectiveness of existing approaches obtained from students, teachers and other stakeholders.

Outputs (O):

- O1 (Updated Educational Policy). Improved teaching strategies and methods to better develop social consciousness.
- O2 (Effectiveness Reports). Analytical reports and evaluations demonstrating the results of changes introduced and their impact on the educational process.

Control elements (C):

- C1 (Regulatory framework). Legislative and regulatory acts governing the educational process and policy.
- C2 (Educational Quality Standards). Criteria and standards that determine the quality of educational programs and teaching activities.

Having formed a tree of goals and a “black box” model, the next final stage in our research will be the creation of a decomposition to achieve the key goal - improving the policy for the formation of social consciousness during training in educational institutions in the pedagogical aspect (Figure 4).

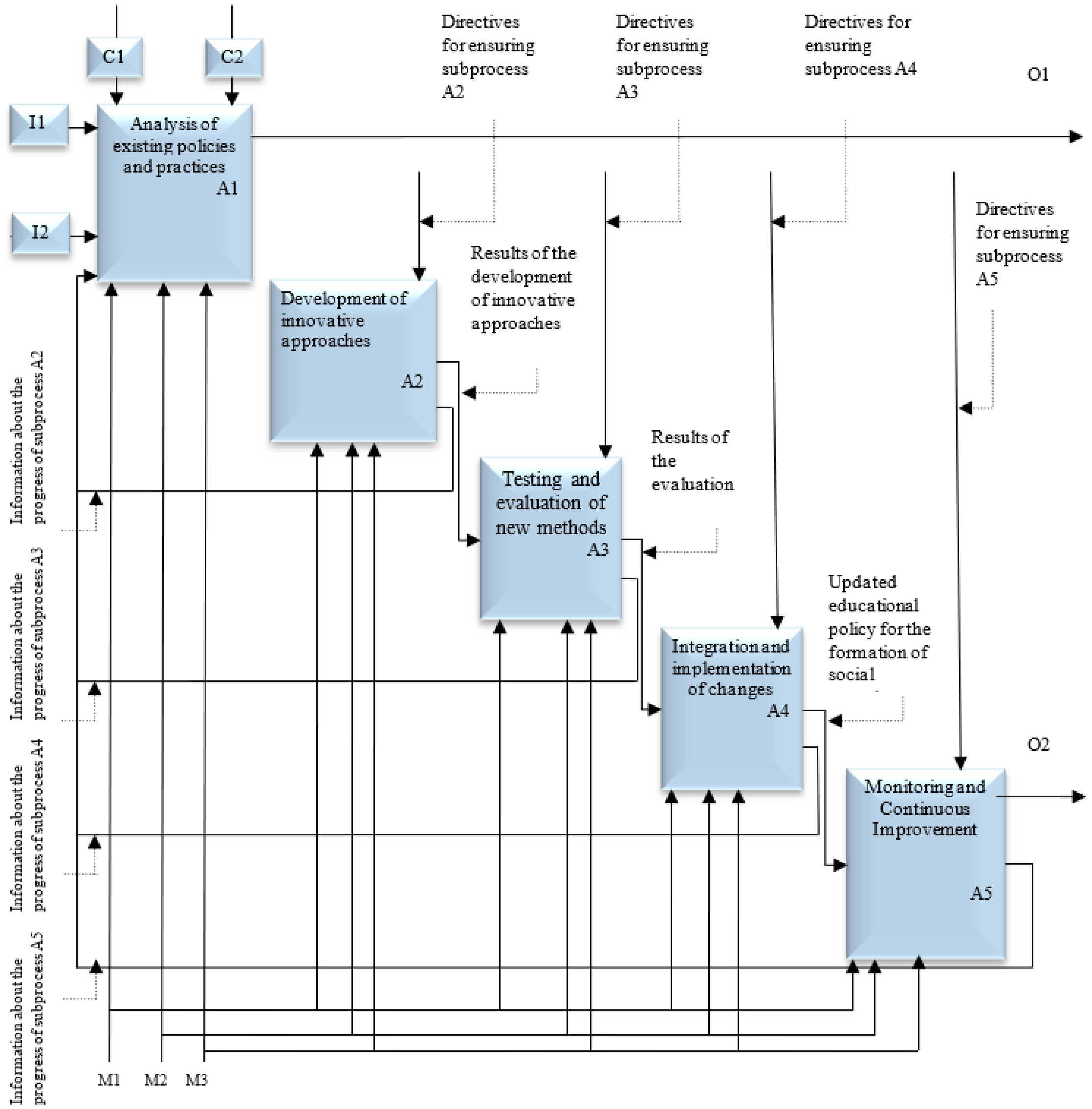

Figure 4. Decomposition of achieving the key goal - improving the policy of forming social consciousness during training in educational institutions in the context of the pedagogical aspect.
Source: (formed by authors)

Let's consider each stage in more detail.

A1. Analysis of existing policies and practices. The essence of this stage is an in-depth study and assessment of current educational policies and methods used to form social consciousness. This includes analyzing effectiveness, identifying shortcomings in approaches, and examining how well they promote critical thinking, social responsibility, and civic engagement among students.

A2. Development of innovative approaches. At this stage, new, more effective teaching strategies and methods are created. This may include integrating emerging technologies, developing interdisciplinary courses, and introducing project-based learning to promote social awareness.

A3.Testing and evaluation of new methods. This stage involves the practical implementation of the developed methods in selective conditions to assess effectiveness. It is important to collect feedback from participants in the educational process, analyze data and adjust methods in accordance with the results obtained.

A4.Integration and implementation of changes. Once effectiveness has been tested and necessary adjustments have been made, new methods are integrated into the broader educational context. This means changing or adapting curricula, teaching and assessment methods, and providing teacher training.

A5.Monitoring and Continuous Improvement. The last stage includes continuous monitoring of the implemented changes and their impact on the educational process and students. This involves regularly collecting and analyzing data and making further adjustments to continuously improve the effectiveness of social awareness policies.

Having carefully applied the IDEF0 method to formulate models for improving social consciousness training policies in higher education, with a focus on the pedagogical aspect, the next critical step is to compare the findings with existing evidence in the scientific literature. This approach allows us to not only determine the extent to which our models correspond to actual trends and practices used in higher education, but also to identify potential areas for further research and development. Such a comparative study provides a deeper understanding of the effectiveness of the developed models and their practical applicability in the modern educational context.

Thus, Pearce & Wood's (2019) study focuses on developing an assessment framework for working with student voice in schools. This work explores how student voice can be integrated into the educational process to transform and enhance learning. Our study differs from their approach because we focus not only on assessing the role of student voice in schools, but also on the integration of innovative pedagogical methods, such as the IDEF0 method, to optimize the process of creating social consciousness.

The work of Kromydas (2017) rethinks higher education and its relationship with social inequalities, focusing on the historical and current state of knowledge and the potential for future development in this area. Our research extends the analysis of higher education and its relationship with social inequalities by providing specific methodological tools and models for improving educational policy, distinct from Kromydas's general analytical approach.

An interesting study by Boluda-Verdu et al. (2022). This systematic review explores eco-consciousness and its impact on health by analyzing how fear for the future and environmental concerns affect the psychological well-being of college students. Compared to their systematic review on eco-axis, our study focuses on a broader range of social consciousness issues, including the development of pedagogical strategies to influence these issues.

At the same time, Colás-Bravo et al. (2018) consider the processes of identifying the level of sustainability consciousness of teachers in the preparation process through e-portfolios, pointing out the importance of integrating persistence into educational practice. Our approach to assessing teachers' resilience is more comprehensive because we integrate tools to analyze and optimize teaching practices at a deeper level than their study.

Similar to the study by Fogelgarn et al. (2021): The study focuses on the use of cues as a pedagogical strategy to promote procedural behavior, analyzing how such an approach can influence student behavior. Our study complements their study of teaching strategies by proposing the IDEF0 method as a means of more systematic and structured analysis of the effectiveness of teaching practices.

Arora & Srinivansen (2020) analyze the impact of the COVID-19 pandemic on teaching in higher education, focusing on the challenges and changes facing educators. Our research goes beyond their analysis of the pandemic's impact on learning by providing a broader context of challenges and opportunities in higher education.

Shevchenko et al. (2019) in their work explores the development of a system to improve the readiness of future teachers for the spiritual and moral development of students in a multicultural space. Our work adds to their research on pre-service teachers' readiness for children's spiritual and moral development by offering new methodological approaches and practical tools.

Also in the work of Orchard et al. (2016) focus on developing new teachers through applied moral decision making, using philosophy as a tool for teacher preparation. Compared to their study of philosophy for teachers, our study proposes a more extensive approach to the development of pedagogical strategies, in particular the use of the IDEF0 method for deeper analysis and improvement of educational processes.

In a study by Melnychuk et al. (2022) focuses on the importance of protecting children's rights in the context of armed conflicts and the challenges facing government authorities. This source is useful for understanding the role of educational institutions in shaping social consciousness, in particular with regard to human rights and the protection of children's rights in crisis situations. Our research covers a wider range of educational issues, not limited only to the protection of children's rights in conflict situations, but focusing on the general formation of social consciousness. We integrate innovative pedagogical approaches and methodologies, in particular the IDEF0 method, for the development and implementation of educational policies.

Having analyzed the results of our study and compared them with data from other literary sources, it can be argued that our research is extremely relevant and brings significant scientific novelty to the field of policy for the formation of social consciousness in higher educational institutions. We not only identified new aspects and perspectives for understanding the pedagogical process of forming social consciousness, but also proposed innovative approaches and methodologies that can be applied to improve educational practices. Our work opens up new opportunities for further research and development in this important area, contributing to the creation of more effective and responsible educational strategies.

Conclusions

Summarizing the consideration of the topic of the formation of social consciousness in the process of education, it is important to note that this area is extremely relevant and complex. The policy of forming social consciousness in educational institutions is crucial for the development of modern society, since it affects the preparation of the younger generation for life and active participation in social processes.

However, an analysis of the current state of this area reveals a number of problems and challenges. In particular, the lack of socio-economic and cultural factors in the development of educational programs often leads to a gap between theoretical knowledge and its practical application. This situation limits the ability of students to develop a deep understanding and critical analysis of social phenomena.

Another important aspect is the lack of attention to the individual needs and characteristics of students. A variety of cultural, social and personal factors require teachers to be able to individualize approaches to teaching, which is often left unaddressed in the educational process.

Also worth noting is the problem of integrating social consciousness into the general educational process. It is often seen as an additional aspect rather than as an integral part of the educational program. This results in students not acquiring systematic knowledge and skills to understand and interact with the social world.

In conclusion, the analysis shows that for the effective formation of social consciousness, an integrated approach is required, including both updating curriculum and training of teaching staff, as well as creating conditions for the practical application of theoretical knowledge in real life. This is the only way to achieve significant changes in the formation of the social consciousness of the younger generation.

During our research, we applied the IDEF0 method to create detailed models of the policy stages of social consciousness formation in the training process in educational institutions, especially focusing on the pedagogical aspect. This method allowed us to clearly define and structure the key functions and processes included in the scope of the policy for the formation of social consciousness. The use of IDEF0 contributed to the creation of visually understandable models illustrating the relationships between different stages and participants in the educational process.

The scientific novelty of our approach lies in the application of IDEF0 in the context of educational policy, which has not previously been widely considered in the literature. This allowed for a deeper analysis and understanding of the complex interactions and dependencies occurring at different levels of the educational system. Our model provides new tools for assessing and planning educational policies that may be useful for educational professionals, policymakers, and researchers.

At the same time, there are certain limitations associated with using the IDEF0 method in this context. Although this method is effective for visualizing and structuring processes, it may not fully capture the dynamics and complexity of social interactions that play an important role in the formation of social consciousness. Thus, our model should be considered as one of the analytical tools that requires complementation with other methods and approaches to understand this multifaceted field.

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