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Models of formation of professional competence of future teachers

Моделі Формування Професійної Компетентності Майбутніх Учителів

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Abstract

The aim of the work was to develop and determine the effectiveness of the model for building future teachers' professional competence. The aim was achieved through the use of calculations of the efficiency coefficient, the coefficient of practical effectiveness, the Cohen's kappa coefficient. It was established that the interactive approach, which was used before the beginning of studies among 15% of students, enabled obtaining a higher level of their knowledge. The traditional education system made it possible to achieve a high level of knowledge among 31% of students. The development of a model for building professional competence of future secondary school teachers provided for the use of non-standard approaches and digital technologies (Coursera, Prometheus). It was found that students showed a high quality of material presentation (3.41) and a lower level of organization of the educational process (0.91) during teaching practice. The results contributed to highly effective knowledge of ecology, informatics, pedagogy/educational methodology

Анотація

Мета роботи полягала у розробці та визначенні ефективності моделі формування професійної компетентності майбутніх учителів. Реалізація мети стала можливою внаслідок використання розрахунків коефіцієнту ефективності, коефіцієнту практичної результативності, коефіцієнту Косна. Встановлено, що інтерактивний підхід, який використовувався до початку навчання серед 15% студентів, дозволив отримати вищий рівень знань серед студентів. Традиційна система навчання дозволила досягнути високого рівня знань серед 31% студентів. Розробка моделі формування професійної компетентності для майбутніх учителів середньої школи полягала у використанні нестандартних підходів та цифрових технологій (Coursera, Prometheus). Встановлено, що під час педагогічної практики студенти забезпечили високу якість подачі матеріалу (3,41) й нижчий рівень організації навчального процесу (0,91). Результати посприяли отриманню учнями середньої школи високої ефективності знань з екології,

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acquired by high school students. It was determined that 62% of students developed high professional competence skills. The practical significance of the work is the developed system of future teachers' professional competence through the introduction of non-standard approaches. The prospects of the research may be related to the provision of options for increasing the level of professional competence for future teachers of secondary and higher educational institutions.

Keywords: professional skills, organization of the educational process, digital competence, educational material, innovative solutions.

Introduction

Transformational changes in society and the economy, which are also reflected in the development of the education system, require the training of specialists with a high level of competence. The future teacher must have a non-standard approach to the organization of the lesson, must dynamically adapt to all changes. A high level of teacher competence in secondary school enables students to form professional areas of training and desire to study (Torres-Hernández et al., 2019). The advantages of the need to build future teachers' professional competence determine the relevance of this article.

The professional competence of secondary school teachers represents a high level of knowledge for fulfilling tasks during the educational process. The appropriate level of professional knowledge and skills can be achieved during classes training and during teaching practice (Berikhanova et al., 2022). A high level of teacher competence helps students achieve high results, influences the development of creative skills. It is possible to build the professional competence through the development of organizational abilities, which affects the organization of education as a whole, the study of a particular topic. The activities of the future teacher should be aimed at comprehensive development, which affects the depth of the acquired knowledge (Sydorenko et al., 2022). A creative approach to teaching students will ensure active interaction with them during the study of the subject. The level of professional competence of a teacher depends on the constant improvement of knowledge, self-realization, development of creative potential, which is reflected in new methods of presenting

інформатики, освітології/методології освіти. Визначено, що 62% студентів розвили високі навички професійної компетентності. Практичне значення роботи полягає у розвитку системи професійної компетентності майбутніх учителів внаслідок запровадження нестандартних підходів. Перспективи дослідження можуть бути пов'язані із забезпеченням варіантів підвищення рівня професійної компетентності для майбутніх учителів середніх та вищих навчальних закладів.

Ключові слова: професійні навички, організація навчального процесу, цифрова компетентність, учбовий матеріал, інноваційні рішення.

information (Meyer et al., 2021). The organization of the educational process is connected not only with the development of lectures and practical classes, but also with the students' independent work. This is reflected in better learning of the material. The correctness of the selection of methodical and didactic tasks affects the level of coverage of a particular topic.

Digital literacy skills should also be developed during the training of future teachers, which affects the interactivity of learning and improves the quality of the educational process (Kleimola & Leppisaari, 2022). Digital technologies improve the methods of presenting information, which affects the process of memorization and automation in assessment. For example, the Quizlet system provides a game approach in learning, thereby enhancing students' motivation in studying the subject (Chorny et al., 2022). It will also be reflected in obtaining a higher level of knowledge as a result of the desire to become a winner in the educational game. The training of future teachers should include a set of interrelated elements that affect the achievement of the final result, the accuracy of the organization of teacher practical actions. Modelling makes it possible to provide detailed assessment of educational processes, ways of presenting information. It also enables determining performance parameters that must be achieved by students at each level of learning (Miotto et al., 2022).

The issues of studying future teachers' professional competence are mostly aimed at studying the advantages of its development. But the issue of developing a unique model for training future secondary school teachers, which

enables students to improve their level of knowledge, is insufficiently studied. Regardless of the direction of training of future teachers, it is possible to promote professional skills development due to the use of innovative solutions in education. The choice of disparate digital technologies that are not interconnected with the curriculum can have a negative impact on the assimilation of information. It can also affect the lack of accuracy in applying the acquired skills practically. The use of digital technologies must be coordinated with the curriculum, which will allow the development of theoretical and practical skills. It will also contribute to the organization of the educational process, which will allow to adjust the implementation of various lesson plans (lectures, seminars, etc.). With the help of modern technologies, it is possible to develop digital competence skills, allowing them to apply a creative approach to learning. But the problem of the issue, which is not sufficiently studied, is related to the selection of the correct digital technologies, which will allow the development of not only basic skills but also contribute to the development of creative potential. The aim of the work is to determine the effectiveness of the level of future teachers' professional competence as a result of the development of a training model.

The aim involved the fulfilment of the following research objectives:

- Determine the relationship between the approach to learning, which was used before the research, and the level of acquired knowledge (organization of the educational process) by students;
- Develop a model for improving the future teachers' professional competence;
- Measure the effectiveness of the level of pedagogical skills of future teachers and the level of acquired knowledge of secondary school students as a result of experimental practice;
- Identify the general level of future teachers' professional competence by calculating the efficiency coefficient.

Literature Review

The improvement of professional training of students majoring in Specialized Education should take into account a comprehensive approach aimed at ensuring effective training. It is necessary to create a training model that will ensure the development of diagnostic competence. It is necessary to determine the approaches that will be used during lessons, in

preparation of presentations, material for visualization (Hladush et al., 2022). The model of building future teachers' digital competence is related to the possibility of using the advantages of the Internet. Information technologies contribute to the change of approaches to the transfer of knowledge, the development of methodical skills, and an emphasis on certain topics. Internet capabilities facilitate both blended and e-learning (Tomczyk, 2022). The use of mind mapping technology contributes to building professional competence of future foreign language teachers. Mind mapping technologies contribute to easier memorization of lexical material, affect the development of speaking skills. The presented system makes it possible for the students to overcome the language barrier. This approach will also enable expanding the vocabulary of specialized words (Ishchenko et al., 2022).

Building future teachers' professional competence should be based on revealing the essence of professional activity. It is important to take into account motivational, procedural, evaluative and reflective criteria during training. Building professional competence should be based on the ability to organize theoretical and practical assignments and extracurricular work. It is also necessary to ensure the search for opportunities for self-development, to ensure the ability to use various digital opportunities, thereby developing mobility (Ismailova et al., 2021). The development of emotional intelligence should be ensured during the training of future teachers, which affects the organization of professional activities. The development of emotional intelligence enables reducing stress and burnout, develop interpersonal relationships. This approach will have a positive effect on classroom management, and will ensure the expansion of the teacher's abilities, as emotional intelligence will provide the ability to perceive, express, and manage different approaches to learning (Valente et al., 2020).

The development of approaches to building professional competence of future chemistry teachers should be based on the analysis of psychological, pedagogical, chemical, and methodological literature. The use of different literature will enable determining the theoretical and methodological foundations of organization of the lesson. It will also enable creating a set of methodical materials that will be directed to the completion of ordinary and creative assignments. The training of future physics teachers should reveal the components of the future teacher's competence; identify

problems that may arise. It is necessary to ensure the development of a methodological system of future teachers' competence; identify criteria that affect the development of professional skills. Achieving a high level of knowledge is possible as a result of informatization and computerization of the educational process (Isyanov et al., 2020).

Perception and assimilation of information by schoolchildren also depends on the level of teacher training. It is necessary to ensure coverage of theoretical and procedural features of the educational process during the training of future teachers. The use of information technologies and modelling will ensure not only the development of professional knowledge, but also the development of information competence of future teachers. The approach can be reflected in ensuring the students' readiness to solve experimental problems (Shyian et al., 2020). Future teachers' professional skills can be developed using the potential of Scratch. The benefits of Scratch's potential were determined using the Kirkpatrick Model. The use of this technology will improve the learning process at various levels. The application of programming processes and elements of mathematical subjects contributes to the improvement of academic skills, which enhances students' motivation (Almeida et al., 2019).

The results of the analysis made it possible to determine that in most cases building professional competence is associated with an emphasis on one academic subject. This involves the analysis of different educational literature on building the correct professional skills. The development of emotional intelligence, computer competence, which includes different approaches to learning, should also be taken into account.

Methods

Research design

The first level of the research involved determining the approach to the training of future teachers applied before the start of the research. The approach was determined on the basis of the authors' study of previous training programmes for each subject. The results were aimed at determining the level of acquired knowledge and the level of organization of the educational process in experimental groups during teaching practice. As the study of each subject is characterized by a different approach, the study of the most widespread one consisted in its use

for more than among 50% of subjects. The first level of research provided for studying the relationship with the method of teaching the subject and determining the level of acquired knowledge and the organization of the educational process.

The second level of research was aimed at developing a model to improve the future teachers' professional competence. The development of the model consisted in providing a unified approach to learning for all course subjects for students of different specializations. The advantages and disadvantages of each approach to learning (traditional, digital, mixed, interactive) were taken into account during the development of the model. This contributed to the creation of a model that will improve future teachers' professional qualifications. The possibilities of using digital technologies to increase the effectiveness of training were also taken into account during the development of the model. The training took place from 2021, which made it possible to deliver lectures and conduct practical classes, as well as teaching practice.

The third level of research consisted in determining the quality of teaching practice among students of grades 9-11, who were included in the experimental group. The practice took place for 1 month, which enabled determining the level of acquired knowledge. The elements of the practice were intended to ensure the organization of the educational process and presentation of educational material. The organization of the educational process by students involved a combination of the accuracy of practical and theoretical materials, the allocation of hours for the study of a separate plan. The process of organizing the education of secondary school students as part of teaching practice was adjusted by teachers to ensure a more accurate organization of education. The presentation of educational material included the form of presentation of educational information, the use or absence of digital technologies, the selection of examples to confirm the topic, etc.

The second level of the research provided for determining the level of knowledge obtained by senior school students during teaching practice. The knowledge on ecology, chemistry, informatics, biology, pedagogy/education methodology (optional) was obtained.

The third level of research involved determining the effectiveness of the developed model for improving future teachers' professional competence. The effectiveness was determined

by understanding the studied subjects, the possibility of variation with different information. It also provided for the possibility of fulfilling professional tasks, applying creative approaches.

Sampling

They survey involved 183 students who were studying to become future teachers. The students studied at the Faculty of Chemistry, Ecology and Pharmacy; future informatics teachers; Departments of Biology, Ecology and their Teaching Methods; Departments of Education and Pedagogy; Department of Management and Educational Methodology. The study involved students of the 3rd year of study from Volyn National University, Kremenets Taras Shevchenko Regional Academy of Humanities and Pedagogy, West Ukrainian National University, and Ternopil Regional Municipal Institute of Postgraduate Pedagogical Education. Restrictions in the choice of students are related to one year of study, which helps to ensure level conditions. Secondary school students (120 people) also participated in the study as an experimental group for the purposes of teaching practice.

Methods

The efficiency coefficient was calculated to determine the effectiveness of the approach to learning, which was used in the educational process. The level of knowledge of the subjects, as well as the level of organization of the educational process, were taken into account during the study of future teachers' professional competence.

$$h_p = f_{compl} \times \frac{t_{theor} + k_{pract}}{a_n}, \quad (1)$$

a_{theor} – an indicator of the level of theoretical knowledge during the study of subjects/during the organization of the educational process;

a_{pract} – an indicator of the level of practical knowledge during the study of subjects / during the organization of the educational process;

a_n – the maximum number of points that can be obtained during training;

f_{compl} – an indicator of the possibility of applying theoretical knowledge to complete assignments of different levels of complexity (the maximum value is equal to 0.3).

The development of the model for improving future teachers' professional competence involved the use of a general theoretical method

of analysis. The method of analysis provided for determining the possibility of implementing the model for the existing university subjects. The development of the model also provided for the analysis of digital technologies that can contribute to improving future teachers' professional competence. This made it possible to choose the use of the most correct Coursera and Prometheus applications within the training model.

The coefficient of practical effectiveness developed by the authors was calculated in order to determine the level of knowledge acquired by students. The calculations made to determine the level of practical knowledge of students and the possibility of their variation when building future teachers' professional competence.

$$k(pract) = \sum_{i=1}^n m_{quality} \log b_{acc}, \quad (2)$$

$m_{quality}$ – evaluation of the quality of the educational process;

b_{acc} – an indicator of the accuracy of the delivery of educational material by future teachers / organization of the educational process (maximum value — 5).

The effectiveness of the material learned was measured to determine the effectiveness of teaching practice among senior school students. The averaged results for the subjects were presented as a result of calculating efficiency coefficients in accordance with formula 1. The presented coefficient was also used to determine the effectiveness of the developed model of improving future teachers' pedagogical competence. The results were reflected in the possibility of practical use of the model for studying different subjects.

Data analysis

Data analysis consisted in the application of statistical calculations to confirm previously obtained results. According to Cohen's coefficient calculations, an analysis of the level of acquired knowledge and the organization of the educational process by students was conducted before the study (Hung & Wang, 2021). Calculations were also carried out to determine the similarity of students' results according to the element of teaching practice. The calculation of the overall efficiency of the students for increasing the professional competence was also supported by the relevant statistical calculations.

$$d = \frac{(M_1 - M_2)}{\sqrt{\frac{S_1^2 + S_2^2}{2}}} \quad (3)$$

M_1, M_2 – average indicators between the values that are compared;

S_1, S_2 – mean square deviation of the compared indicators.

The interpretation of Cohen’s coefficient is characterized by a strong correlation, if the value is equal to 0; weak correlation — 1; lack of correlation — 1.

Ethical criteria

Ethical norms were achieved in the direction of ensuring equal conditions for all respondents of

the study. It was also envisaged to achieve the novelty of the work, which excluded the use of materials from previously published articles. The authors exclude possible conflicts of interest and confirm the uniqueness of this work (National Research Ethics Committees, 2016).

Results

The level of future teachers’ professional competence affects the level of their transfer of knowledge to students for learning a particular subject. The impact on the formation of professional competence has a directly chosen approach to the training of future teachers. Therefore, the learning process was determined at the beginning of the research among the students (Table 1).

Table 1.
The level of professional competence of students before the beginning of the study

Approach to learning	Number of students	Level of obtained knowledge			The level of organization of the educational process (in experimental groups)			d (Comparison between high level)
		High	Sufficient	Low	High	Sufficient	Low	
Traditional	40%	0.51	0.48	0.24	0.52	0.44	0.22	0.021
Digital	22%	0.55	0.47	0.21	0.53	0.45	-	0.027
Blended	23%	0.53	0.43	0.23	0.51	0.42	0.25	0.031
Interactive	15%	0.55	0.45	-	0.54	0.46	-	0.024

Source: developed by the authors

The results revealed that the traditional approach to learning was the most widespread during the training of future teachers. However, in accordance with the traditional approach to learning, a sufficient level of acquired knowledge prevailed (62%), 31% of students obtained high results. The acquired knowledge is related to the assimilation of theoretical material and completion of practical assignments. It was established that professional skills, understanding, and the ability to transfer knowledge to students were insufficiently developed among this group of students. The results were found during classes in experimental groups. Most students reached a sufficient level during the organization of the educational process in experimental groups.

It was found that blended learning, which involved the partial use of digital technologies, ranked second. Blended learning contributed to the fact that 55% of students acquired a sufficient level of knowledge, while 42% acquired a high level. The use of this approach was reflected in the involvement of multimedia boards, specialized programmes, which facilitated the assimilation of a greater amount of professional information and terminology. Blended learning

also contributed to a more accurate organization of the students’ educational process, which contributed to an accurate ratio of practical and theoretical material for study.

The digital approach among students made it possible to obtain a high level of knowledge among 54% of students. The results contributed to the solving of problems of higher complexity, the use of a creative approach to solving problems. It also helped to increase the accuracy of the organization of the educational process for the students of the experimental group.

The least widespread was the interactive approach to learning (15%), which was associated with the use of various interactive games and the use of specialized technologies. Interactive learning in connection with its non-standard approach contributed to the development of a high level of professional competence among 71% of students. A total of 65% of students were able to achieve a high level in the organization of the educational process. This contributed to the development of educational games for students, which improved learning of the material.

Further, a training model, which is aimed at optimizing the educational process, was developed to improve future teachers' professional competence. The development of

recommendations is aimed at ensuring understanding of the educational information, which builds basic and professional skills (Figure 1).

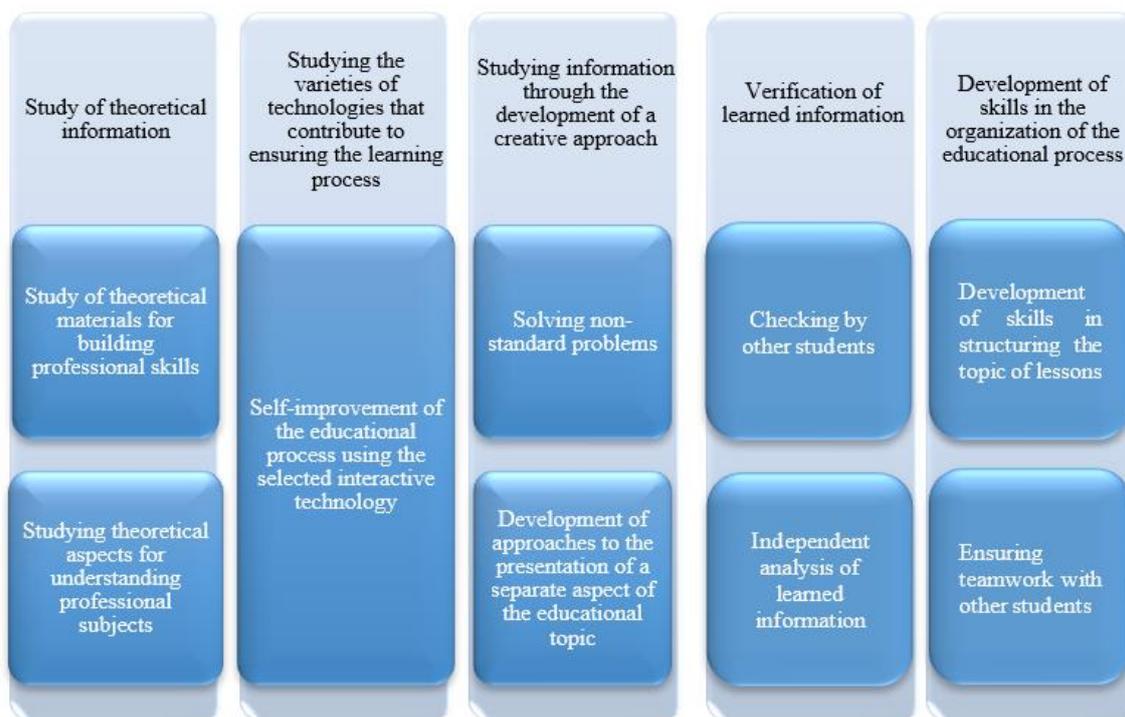


Figure 1. The Model of building professional competence of future secondary school teachers.

Source: developed by the authors

According to the model of improving professional competence, the study of theoretical information should be a priority. This element of the model should include the thorough study of subjects from the university curriculum that contribute to the training of future teachers. They also affect the possibility of the study of professional subjects. The implementation of the study of theoretical information provided for the use of the Coursera digital application, which simplified presentation of information in the form of schemes and structural charts. The advantages of the application are related to the possibility of using information from 275 different universities, which enables students to deepen their knowledge. It also promotes the use of various opportunities for flexible perception of information.

The developed model is also aimed at building the digital competence of future teachers. This process is of great importance because it helps to ensure non-formal learning. This will later be reflected in the possibility of implementing practical skills for preparing classes for students. The development of digital competence ensures correctness in information management. It also

enables achieving a higher quality level of understanding of new knowledge. Digitization of education consists in the study of various technologies that support the learning process. It is also related to the study of the possibility of self-improvement of the educational process using the selected interactive technology.

The development of a creative approach is also an important element of the digital competence development model. Because it is aimed at solving non-standard problems and developing approaches to the presentation of a separate aspect of the educational topic. Creative skills contribute to the improvement of the quality of education as a result of adopting non-standard approaches to studying and presenting the material. It also promotes communication, diverse implementation of educational projects. The Prometheus online platform was used at this stage, which facilitates the distribution of the created lectures.

An important aspect of training is the verification of learned information, which promotes building future teachers' professional competence. For better assimilation of the studied material, it was

suggested to ensure that the assignments are checked by other students, as well as to emphasize independent analysis of the information learned. The purpose was to identify mistakes and provide their detailed explanation, indicating the correct approaches to solve it.

The development of skills in the organization of the educational process is an integral element of the professional competence building model, as it will ensure a high level of education of secondary school students in the future. During

training, emphasis is placed on developing skills in structuring the topic of lessons and ensuring teamwork with other students.

Conducting training in accordance with the developed model made it possible to determine how the approach to training was reflected in the level of students' practical skills. The results were verified through experimental practice of students during classes among secondary school students (Figure 2).

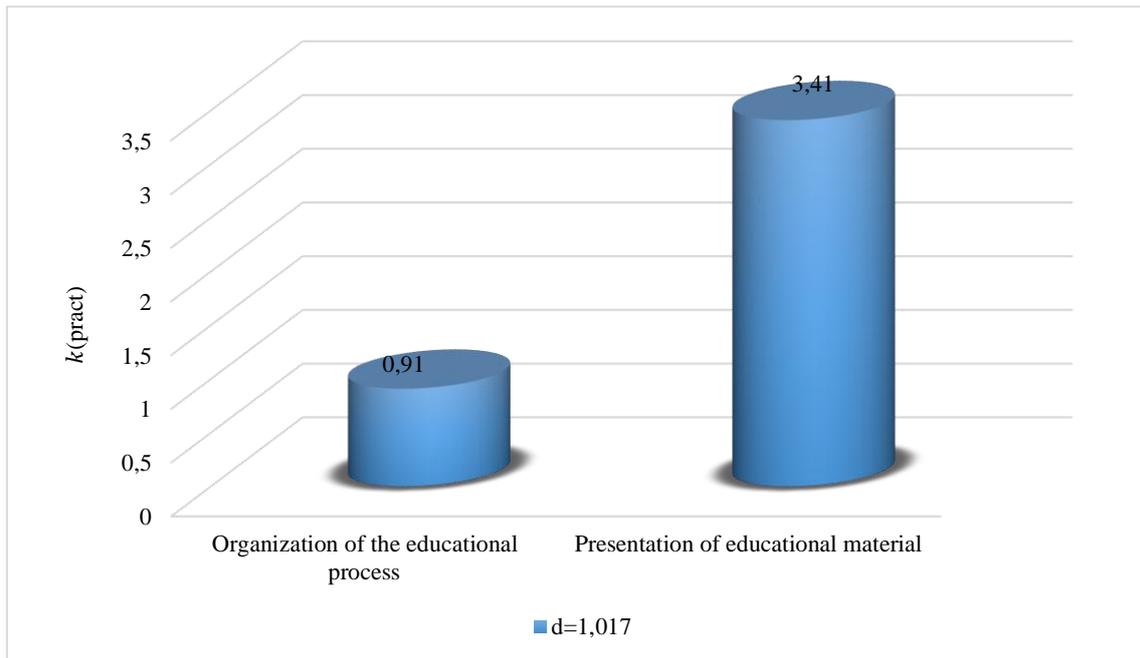


Figure 2. Determining the efficiency of teaching practice by future teachers

Source: developed by the authors

Conducting teaching practice of students made it possible to determine that the presentation of educational material was implemented better than the organization of the educational process. The differences are determined by the fact that the future teachers studied the topic of the lesson in detail and ensured that it was presented in a non-standard and understandable form. The Prometheus online platform was used during the development of the topic of the lesson. The organization of the educational process lacked correctness in the distribution of lectures,

practical classes, checking homework and obtaining intermediate knowledge. Mistakes in the organization of training were also associated with the selection of information that was characterized by a high complexity or did not sufficiently correspond to the topic of the lesson.

The level of knowledge the students acquired was determined After the practice. The distribution of the effectiveness of knowledge is provided in accordance with the professional specialization of future teachers (Figure 3).

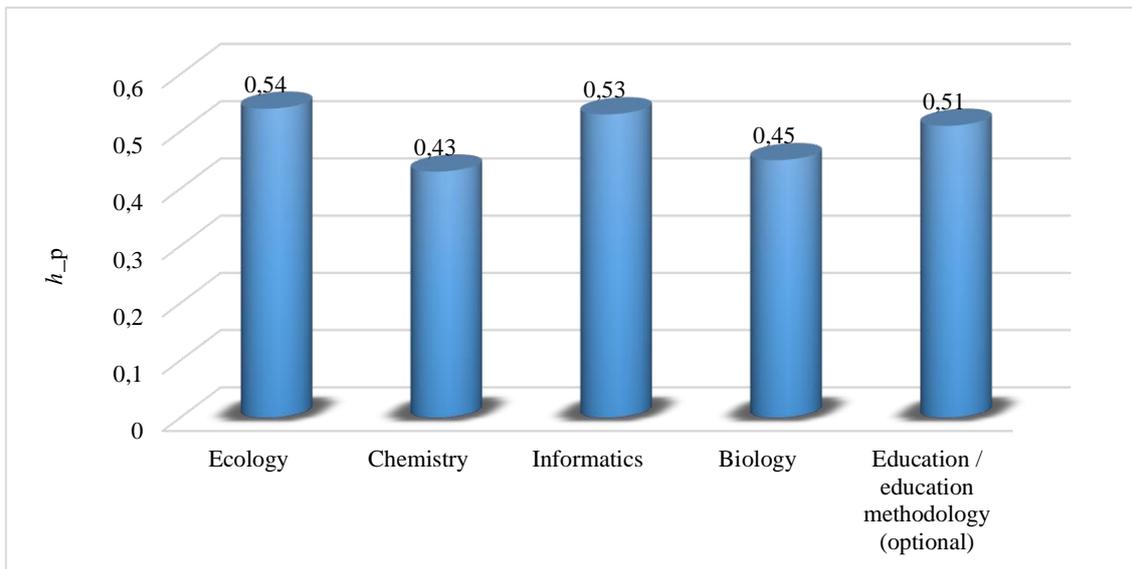


Figure 3. Determining the effectiveness of the knowledge acquired by secondary school students as a result of the students' teaching practice

Source: developed by the authors

The results of the practice showed that the secondary school students had the highest level of efficiency when studying Ecology. This is explained by the fact that the students explained in detail the topics of environmental protection, identified existing environmental problems in Ukraine (world). Students better understood the presented material with the help of its visualization (drawings, photos of ecosystems, pollution). Knowledge of informatics was also developed at a high level. As the development of students' digital competence allowed them to develop skills for working with various programmes. The results were also reflected in the creation of interesting approaches to the presentation of information, which enhanced students' interest. The study of optional subjects

(educational studies/educational methodology) provided an understanding of the peculiarities of pedagogy.

Knowledge of chemistry, biology was obtained at almost the same level (sufficient level), which is explained by the lack of accurate organization of education. Because the students chose topics that did not correspond to the students' level of knowledge.

The last level of the research provided for determining the overall effectiveness of professional competence acquired by future teachers. The results were obtained through the calculation of efficiency coefficient (Figure 4).

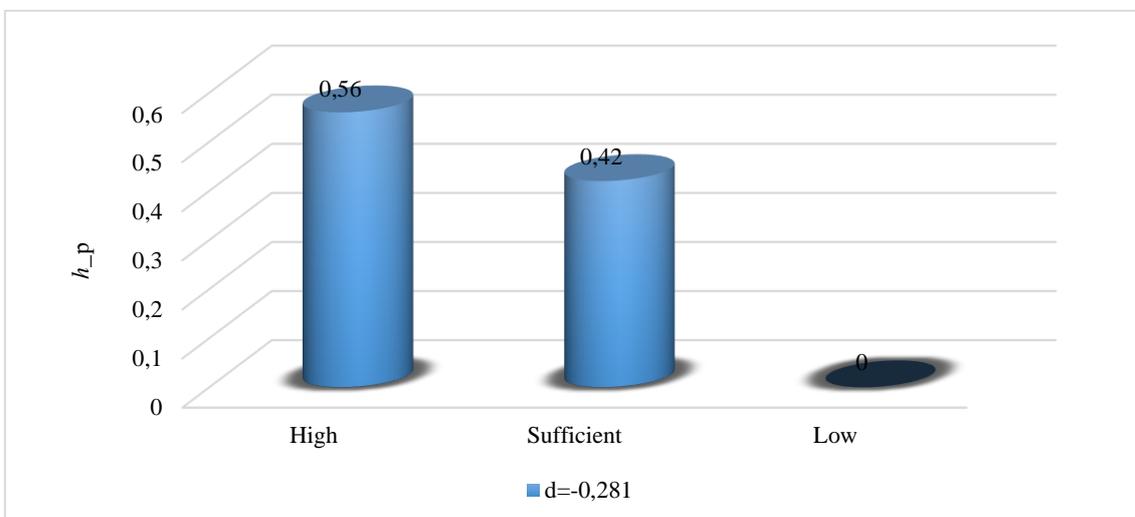


Figure 4. Determining the overall efficiency of professional competence acquired by future teachers \

Source: developed by the authors

It was established that 62% of students obtained a high level of professional competence, which is related to the understanding of specialized subjects. These students can vary their knowledge, use it in different situations and complete assignments of different complexity. A part of the students (38%) acquired a sufficient level of knowledge, which helps to improve their professional competence. A sufficient level is associated with the availability of relevant knowledge, but the lack of the ability to use it when completing complex assignments.

Discussion

Innovative educational solutions contribute to the development of future teachers' competence, which contributes to the formation of high-quality content analysis. Future competence should be related to subject development, self-awareness, and self-control, which develops literacy, self-awareness, purposefulness. The development of analytical abilities should be ensured during training, which allows for the wide use of digital tools, to ensure the visualization of social interaction (Kleimola & Leppisaari, 2022). Mind maps can be advanced learning methods for developing professional skills. Group training should be provided, which will enable joint study and discussion of a particular topic. Learning a foreign language should be combined with improving writing skills, providing analysis of theoretical and practical aspects. The development of mind maps can be a powerful tool for creating an effective learning environment that enables co-writing texts. The information is better memorized during the discussion and analysis of the topic with other students in the group (Ishchenko et al., 2022). The development of students' digital competence improves the level of professional knowledge, especially during initial training, which includes the possibility of variation in theoretical knowledge. The lack of digital competence can result in improper exchange of information, the identification of the most necessary information. Digital competence also contributes to self-improvement through the study of additional information (Gallego-Arrufat et al., 2019). In this work, the development of digital competence of future secondary school teachers is only one of the elements of the professional competence development model. Emphasis was also placed on studying theoretical information, developing creative skills, checking the level of learned information, and developing skills for organizing the educational process.

Building future teachers' professional competence requires taking into account life experience, intellectual and psychological potential, developing the ability to present material. This contributes to the development of a new pedagogical idea, the development of the principles of providing information and supporting students. It is reflected in the level of individual knowledge, the development of approaches to the perception and assimilation of information (Rustamova, 2020). The quality of acquired professional knowledge can be improved as a result of studying the necessary subjects during the educational process. Accurate organization of training and study of the necessary subjects contribute to the relationship between teachers and students, which improves memorization of information. The development of emotional intelligence of future teachers enhances students' interest in the perception of information (Valente et al., 2019). This work does not establish the relationship between teachers and students. However, emphasis was placed on determining the relationship between the level of professional competence acquired by students and the level of knowledge of secondary school students. The results were obtained after the teaching practice.

The level of future teachers' professional competence depends on the availability of appropriate working conditions and the quality of information delivery. During training, it is necessary to ensure the development of mobility of future teachers, which helps to find the necessary information, to solve problems of varying complexity. Conscious perception of educational information ensures its long-term memorization, which is manifested in the variety and accuracy of use (Ismailova et al., 2020).

Review of previously published works showed that great attention is paid to the development of future teachers' professional competence. But most of the studies are related to determining the relationship between the level of professional knowledge and focus on digital competence. This research primarily establishes the relationship between the approach to learning and the level of professional competence. This contributed to the creation of a model for the development of professional competence of future secondary school teachers. The developed model was intended for the entire educational process, excluding the focus on a separate subject. The obtained data were aimed at determining the effectiveness of students' knowledge in the learning process. The level of assimilation of information by high school students who

participated in training during teaching practice was also taken into account.

Conclusions

The proven effectiveness of training future teachers by using the model developed by the authors contributed to the achievement of the determined aim of the research.

Determining the approach to learning, which was used among students before the research, made it possible to reveal its impact on the level of students' knowledge. Namely, the level of acquired professional competence and the level of organization of the educational process in experimental groups. It was established that a high level of knowledge among students was achieved through the use of interactive (71%), digital (54%), and blended (42%) learning. This is determined by the possibility of non-standard information presentation, enhancing students' interest. These approaches contribute to the visual perception of information, which affects better memorization.

The development of the training model was aimed at building future teachers' professional competence. The model involved the study of categories that contribute to learning theoretical information and building digital competence. The development of creative skills was also provided, which is related to the solution of non-standard problems, the development of approaches to the presentation of a separate aspect of the educational topic. In accordance with the developed model, the emphasis was also placed on checking the learned information, developing the skills of organizing the educational process.

It was established that the students developed the skills of correct presentation of educational material at a higher level (3.41) during the teaching practice. They were achieved due to the use of various charts, educational schemes, the selection of interesting examples that attracted students' attention. The level of organization of the educational process was also established (0.91), which was characterized by mistakes in the ratio of theoretical and practical information. It was found that secondary school students obtained the highest scores for Ecology (0.54) and Computer Science (0.53) during teaching practice. The results are related to the quality of the selected information and its presentation. The level of future teachers' professional competence was high among 62% of students, which confirms the effectiveness of the used model.

The practical significance of the work implies the possibility of improving future teachers' professional competence as a result of orientation towards the developed model of education. The prospects of the research will be related to conducting a comparative analysis of the level of professional competence according to the developed model among students majoring in the humanities and mathematics.

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