

## Training in cooperation with the use of information technology

### Обучение в сотрудничестве с использованием информационных технологий

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#### Abstract

Training of modern graduate takes place in the conditions of requirements of the Federal state educational standards aimed at development of students' competences. In order to train a competent graduate, higher education institutions are looking for ways that will make this process more effective and dynamic. The purpose of the article is to analyze the experience of higher education institutions in the implementation of training in cooperation with the use of information technology. The wide development of information technologies and their penetration into various spheres of society has determined their implementation in the educational process. The use of information technology is based on the use of personal computers. Now this tool is an integral part of the modern educational process. Placing emphasis on the fact that learning in cooperation is not a fundamentally new technology the authors say that it acquires relevance by incorporating innovative technologies. The article considers the ideas of training in cooperation with the use of information technologies, raises the importance and significance of this issue in modern educational conditions. Training in cooperation expands the students' information field. On the basis of the study of scientific literature, the

#### Аннотация

Подготовка современного выпускника проходит в условиях требований Федеральных государственных образовательных стандартов, нацеленных на развитие компетенций студента. Для того, чтобы сформировать компетентного выпускника высшие учебные заведения изыскивают способы, которые позволят сделать данный процесс более результативным и динамичным. Цель статьи заключается в анализе опыта высшего учебного заведения по реализации обучения в сотрудничестве с использованием информационных технологий. Широкое развитие информационных технологий и их проникновение в различные сферы жизни общества определило их внедрение в образовательный процесс. Применение информационных технологий осуществляется на основе использования персональных компьютеров. Теперь данное средство является неотъемлемой частью современного образовательного процесса. Ставя акцент на то, что обучение в сотрудничестве не является принципиально новой технологией, авторы говорят о приобретении ей актуальности за счет включения в нее инновационных технологий,

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features of training in cooperation, its essence and value purpose for the formation of competence of students of pedagogical University are highlighted. The study suggests an increase in students' motivation to study materials after the introduction of information technologies that allow them to be more mobile and creative. The process of mutual learning in the process of cooperation becomes more effective. The higher the motivation of the student to study the discipline is, the higher the level of his knowledge is. The results of the study can be used in the further implementation of information technologies for the development of the learning process in cooperation.

**Key Words:** competence, competence approach, electronic technologies, information technologies, training in cooperation.

в данном случае информационных. Обучение в сотрудничестве на основе интерактивных технологий позволяет расширить информационное поле каждого конкретного обучающегося и всех в целом. В статье рассматриваются идеи обучения в сотрудничестве с использованием информационных технологий, поднимается важность и значимость данного вопроса в современных образовательных условиях. На основе изучения научной литературы выделены особенности обучения в сотрудничестве, его сущность и ценностное назначение для формирования компетентности студентов педагогического вуза. Проведенное исследование позволяет сделать вывод о повышении мотивации студентов к изучению материалов после внедрения информационных технологий, которые позволяют им быть более мобильными и творческими. Процесс взаимообучения в процессе сотрудничества становится более результативным. Чем выше мотивация студента к изучению дисциплины, тем выше уровень его знаний. Результаты исследования могут быть использованы при дальнейшем внедрении информационных технологий для развития процесса обучения в сотрудничестве.

**Ключевые слова:** информационные технологии, компетентность, компетентностный подход, обучение в сотрудничестве, электронные технологии.

## Introduction

Despite the modern reformation processes taking place in the field of higher education, which have determined the direction of innovative development, it is necessary to pay attention to the value of traditional technologies which are gaining new importance in the preparation of competitive graduates (Ilyashenko et al., 2019b). When combined with innovative technologies, they allow better results (Nikonova et al., 2019b). In this regard, we highlight the training in cooperation which has existed in pedagogical science for a long time but with the introduction of information technology, this type of training has become more intensive and effective, allowing the formation of competencies that are the goal of modern vocational education (Bartkiv et al., 2018). The form of cooperation allows forming a full-fledged versatile personality of the student (Bulaeva et al., 2018). Participation in group activities gives students the opportunity to become creative, independent and initiative. Cooperation creates conditions for success which

gives a new motivational impetus to the study of materials. Self-learning and mutual learning are developing (Ivanova et al., 2019). The advantages of training in cooperation are: gaining experience, individual pace of work; increasing individual responsibility on the background of work on the overall result (Ilyashenko et al., 2019a); the development of skills of working with information; improving logical thinking, consistent and reasoned presentation of the material (Vaganova et al., 2019a). The modern organization of training in cooperation involves a large share of independent work, but some control by the teacher is necessary and in this case in traditional training there are problems, because after the completion of classroom sessions communication with the teacher becomes difficult (Rakhimbayeva et al., 2019). Today, this problem is solved through the use of information technology. Active cooperation continues in extracurricular time with the help of LMS

Moodle where students have the opportunity to send files to each other, perform joint tasks, use lecture materials, to which there is round-the-clock access (Vaskovskaya et al., 2018). That is, students can at any time refer to the materials and fill in the gaps, find answers to existing questions (Abramova et al., 2018). Building a learning process using information technologies is an integral part of modern education as students are used to using them in their lives and will have to work with them in the professional sphere (Ihnatenko, et al., 2018). The combination of training in cooperation and information technologies will allow achieving the best results in the process of specialists' competence development.

### **Theoretical framework**

The wide development of information technologies and their penetration into various spheres of society has determined their implementation in the educational process (Vaganova et al., 2019d). The use of information technology is based on the use of personal computers. Now this tool is an integral part of the modern educational process. New information technologies are electronic tools that provide solutions to various educational problems, for example, interactive and methodological support of educational materials. Information technologies have a number of positive features that have a positive impact on the formation of the student as a future professional (Vaganova et al., 2019b). They provide him with better assimilation of material, constant access to educational resources, make him more mobile and contribute to increased motivation (Klinkov et al., 2019). The objectives of information technology are to create interactive environments to manage the process of cognitive activity and open access to all students to information and educational resources (electronic textbooks, glossaries, training sites and databases) (Kamenez et al., 2019). While reducing the number of classroom hours, information technology plays an important role in collaborative learning, as it allows for the creation of a quality learning base (Vaganova et al., 2019e). That is, when the classroom load is reduced, the quality of education in higher education not only does not decrease, but also increases (Prokhorova et al., 2018). Information technologies are aimed at theoretical knowledge development, as well as practical skills and contribute to the better development of professional competence (Denysenko et al., 2018). The use of information technologies in the process of learning in cooperation allows

maintaining the effectiveness of interaction not only between students and students, but also between students and teachers (Oros et al., 2018). However, it is not the teacher who is the main source of information, but the students themselves (Sedykh et al., 2019). Through their independent activities, they extract relevant information (Pichugina et al., 2019).

The role of the teacher is to set goals and advise on issues arising in the process of students' assignments. The use of information technology makes traditional collaborative learning innovative (Vaganova et al., 2019f). Modern information technologies allow students to use graphics, sound, animation and video (Smirnova et al., 2019). Information technology provides the following opportunities: providing and receiving information in various forms (Vaganova et al., 2019c); effective monitoring of learning outcomes; activation of students' cognitive activity (Nikonova et al., 2019a); development of students' independence (Pometun et al., 2018); formation of critical thinking; formation of competencies (Osadchenko et al., 2019). The introduction of information technologies significantly accelerates the process of information transfer, the formation of educational and professional experience. Modern information technologies allow students to successfully adapt to changes in educational sphere (Chirva et al., 2018).

Training in cooperation on the basis of interactive technologies has a number of features: the expansion of the information field of each individual student and everyone in general (students learn from each other to make decisions, discuss, make collective decisions, develop mental activity); students undergo a process of socialization (learn to ask questions, build their evidence position, listen to their opponents and listen to their opinion, put themselves in their place. At the same time, students are constantly aware of the importance of constant interaction, they understand their responsibility for the overall result of the group, for all collective work. In the process of learning in cooperation on the basis of information technology, students perform different roles, such as mediator, discussion leader, motivator and exchange them); communication (students learn to lead a discussion, manage it, motivate participants and avoid conflict situations); the implementation of reflection (the activity of participants in each group is evaluated, each student conducts a self-evaluation of own activity, activity group, activity); interdependence (members are dependent on

each other in the course of the job) (Garnevska et al., 2018). Interdependence can be different: the unifying factor can be a single goal, which is realized by students and which they need to achieve together; dependence on sources of information, when each of the students owns only part of the information to achieve their goals and they have to interact; dependence on the type of encouragement (each individual student receives an individual assessment and general tasks) (Smirnova et al., 2018a).

### Methodology

The study involved 120 people, randomly selected, whose major is "Vocational training (in industry)". In the course of the study, we identified the level of motivation of students to study the course "General and professional pedagogy" (before the introduction of information technologies in training in cooperation and after). We identified experimental and control groups of 60 students. Collaborative learning was introduced in the pilot group. At the beginning of the experiment, the level of internal motivation of students of the control and experimental groups was at about the same level. In the experimental group, the average level is observed in a slightly larger number of people than in the control group. The level of motivation in the experimental group of students became higher at the end of the study. In the control group, only minor changes for the better were noted, most likely due to personal factors of students that influenced their motivation. 35% of students had a low level of motivation before the introduction of training in cooperation on the basis of information technologies, after the study we were able to identify a significant decrease in the number of students with a low level of motivation (8%). The number of students in the experimental group with a high level of motivation increased from 25% to 42%.

We also checked the learning coefficient in the control and experimental groups at the time of

completion of the study. In the control group, the score "5" in 30% of students, in the experimental-40%, "4" - 35% and 50%, respectively, the score "3" in the control group in 30%, in the experimental - 10%. A marked decrease in bad grades indicates the effectiveness of the introduction of information technology in the learning process in cooperation.

### Results and discussion

In the process of research during 2018, we conducted a series of classes on the discipline "General and professional pedagogy" for 2nd year students with the use of training in cooperation on the basis of information technology. The peculiarity of this type of training is that students are divided into small groups and engaged in activities that unite all participants with a single goal. At the same time, everyone is responsible for himself and for the overall result. The individual contribution of each student is taken into account. Students take on different roles and change them throughout the course of the course. It can be organizers, experts, performers, leaders, researchers (depending on the type of task, it can be a project, a game, a discussion or some other method used in the course of training in cooperation). This allows you to observe the principles on which problem-based learning (self-development, self-realization, mutual learning). Students learn to interact effectively, find creative, non-standard solutions to problems that may arise in real professional activity. The study compared the results of IT use in the process of learning in cooperation (experimental group) with the results obtained in the group where learning in cooperation was not accompanied by information technology. a total of 120 people took part in the study. In studying the discipline, it was important for us to find out the level of motivation of students. Table 1 shows the results of educational motivation.

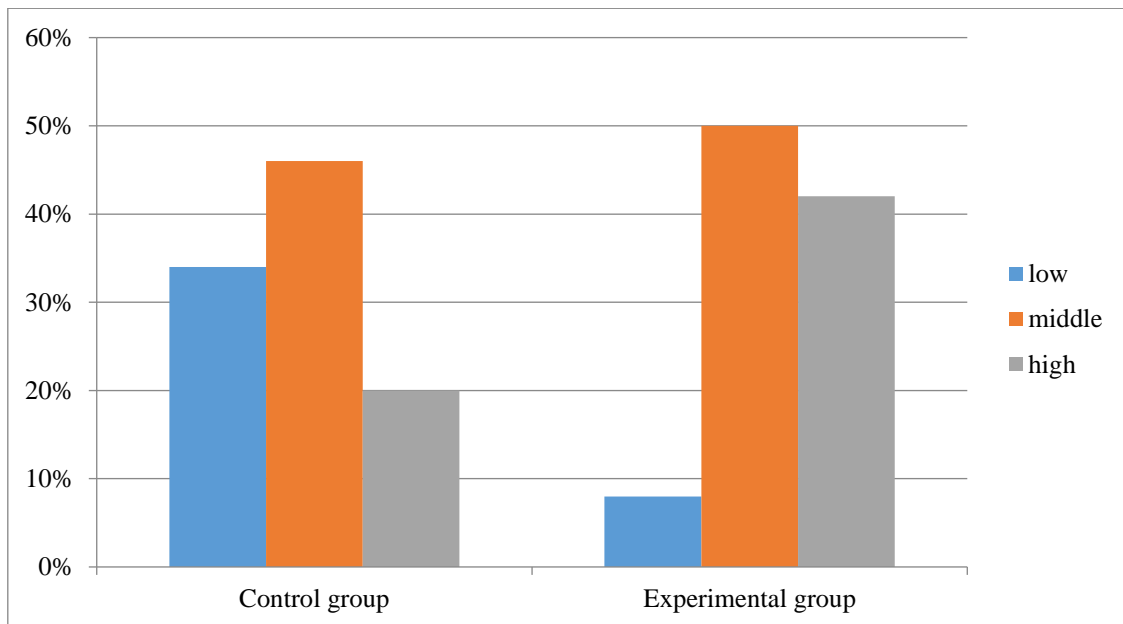
**Table 1.** Results of revealing the level of educational motivation of students

Groups	Number of students	Indicators of the level of educational motivation					
		At the beginning of the study			At the end of the study		
		low	middle	high	low	middle	high
Experimental	60	35%	40%	25%	8%	50%	42%
Test	60	36%	39%	25%	34%	46%	20%

As we can see, the level of motivation in the experimental group of students became higher at the end of the study. In the control group, only minor changes for the better were noted, most likely due to personal factors of students that influenced their motivation. It should also be noted that 35% of students had a low level of motivation before the introduction of training in cooperation on the basis of information technologies, after the study we were able to

identify a significant decrease in the number of students with a low level of motivation (8%). The number of students in the experimental group with a high level of motivation increased from 25% to 42%.

For clarity, increasing the motivation of students to study the course "General and professional pedagogy" we will reflect the results in the figure.



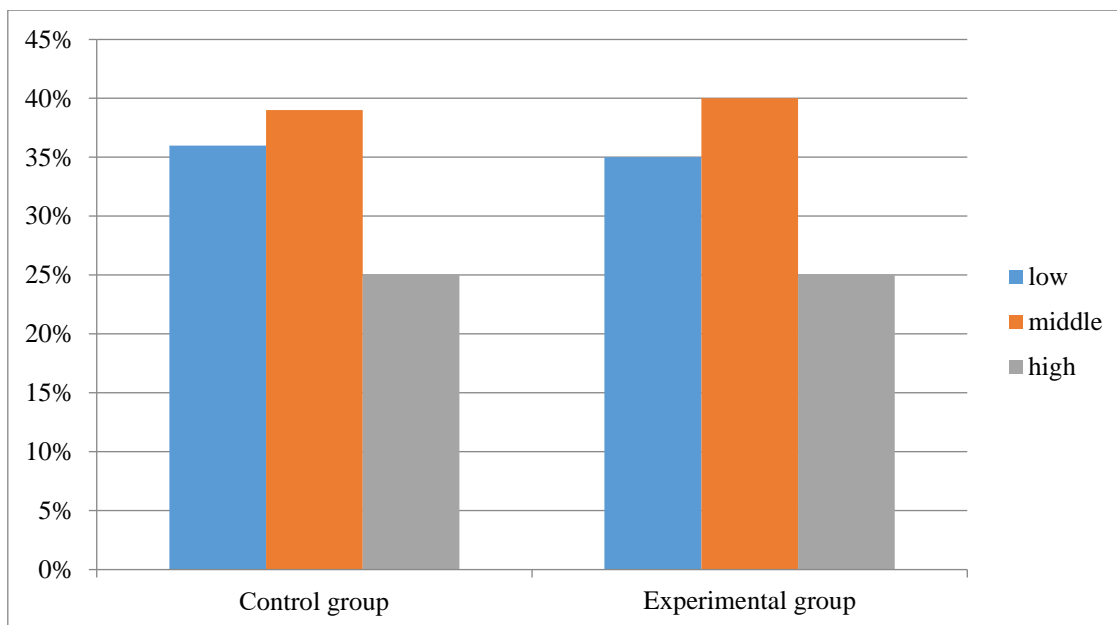
**Fig. 1.** The level of motivation in the control and experimental groups at the beginning of the experiment

At the beginning of the experiment, as we can see, the level of internal motivation of students of the control and experimental groups is at about the same level. In the experimental group, the average level is observed in a slightly larger number of people than in the control group.

The students of the experimental group were actively trained in cooperation on the basis of information technologies. Students were divided into subgroups of 5 people. They carried out case-tasks and projects on the theme "Individual style of teacher's activity", studied the basics of

pedagogical design and actual problems of pedagogical education. The teacher placed necessary materials for the study of the course on the electronic course in LMS Moodle. For the project, students used the Wiki tool, which allowed them to work together at a distance from each other. Each participant could add necessary elements there.

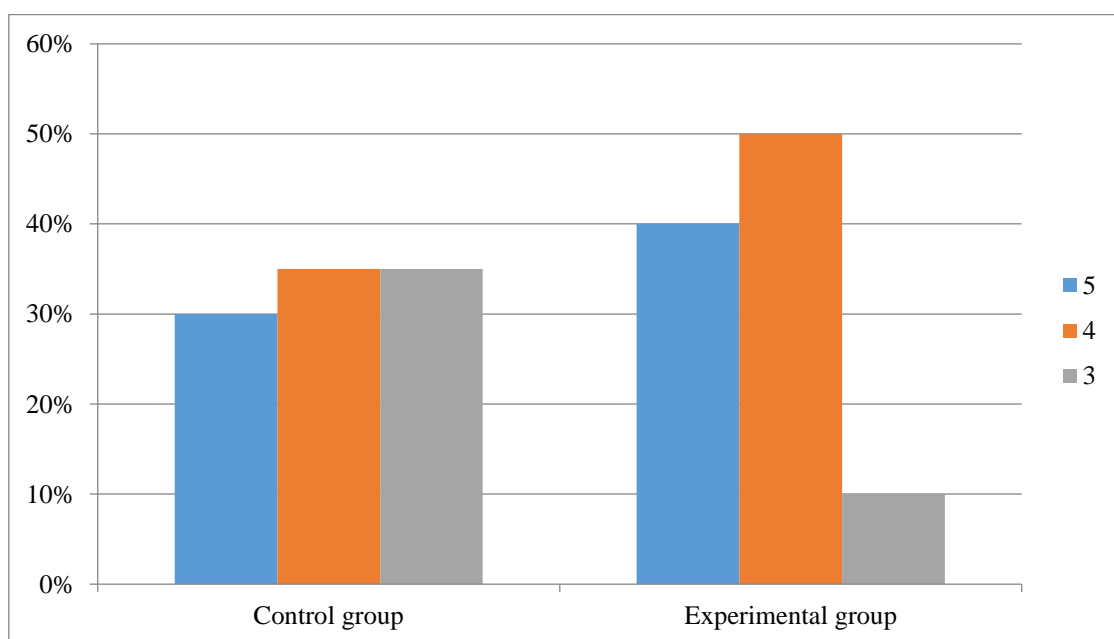
Figure 2 shows the results of testing the motivation of students in the experimental and control groups as part of our study after completing the course.



**Fig.2.** The level of motivation in the control and experimental groups at the beginning of the experiment

To identify the level of knowledge of students in the course "General and professional pedagogy" we have established the coefficient of knowledge assimilation. Figure 3 presents the results of the experimental and control groups of students. Satisfactory, sufficient and high levels are allocated. High level means confident knowledge of the student on the subject, the ability to use them in practice, a deep knowledge of the

conceptual apparatus. Sufficient level assumes that students have good knowledge of the discipline, know the basic and sufficient terms and can apply theoretical knowledge in practice. Satisfactory level is characterized by low knowledge of students in the course, students do not show willingness to use existing knowledge in practice. Score 5 corresponds to a high level of learning, 4-sufficient, 3-satisfactory.



**Fig. 3.** The coefficient of learning identified by the results of our research in the control and experimental groups

The results of our study showed if in the control group the score "5" in 30% of students in the experimental-40%, "4" - 35% and 50%, respectively, the score "3" in the control group in 30%, in the experimental - 10%. A marked decrease in bad grades indicates the effectiveness of the introduction of information technology in the learning process in cooperation.

### Conclusions

We analyzed the experience of higher education institutions in the implementation of training in cooperation with the use of information technology. They provide better assimilation of the material, constant access to educational resources, make the student more mobile and help to increase motivation. The study allowed us to establish that the use of information technology in the process of teaching students in cooperation has a positive effect on the level of motivation of students. The more and more information technology is used, the higher the level of motivation of students to study the discipline, and the higher the level of motivation, the better the level of the discipline, the higher the evaluation of students at the end of the discipline. With the help of information technology, the teacher activates students' educational activities outside the classroom and develops interaction with all students, which allows increasing the effectiveness of the study of courses and the learning process as a whole.

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