

## Artículo de investigación

**Formation of competence in the possession of modern educational technologies at a university**

Формирование компетентности во владении современными образовательными технологиями в вузе

Formación de competencias en la posesión de tecnologías educativas modernas en una universidad

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<http://orcid.org/0000-0001-8347-484X>**Abstract**

Training of teachers of vocational training is focused on the needs of society incompetent professionals. Therefore, pedagogical universities are aimed at improving the training of students and today technological competence comes to the fore.

The formation of the process of mastering educational technologies in the educational process is a long and multifaceted process. It affects both the study of disciplines of professional and pedagogical cycle, and specialized disciplines. The study of the theoretical foundations of modern educational technologies in the study of the discipline "Pedagogical technologies" at the University is continued in the use and application of technologies in the educational pedagogical practice in institutions of secondary vocational education.

The study of the discipline "Pedagogical technologies" allows students to master the theoretical and methodological foundations of the technological approach in vocational education, modern educational technologies, methods and technological methods of teaching using a variety of forms of work (problem lectures, research projects, independent work in the electronic educational environment, group discussions, practical tasks and case studies).

The author substantiates the idea of the need for the formation of technological competence as an integral element in the formation of a modern

**Аннотация**

Подготовка педагогов профессионального обучения ориентируется на потребности общества в компетентных специалистах. Поэтому педагогические вузы нацелены на совершенствование подготовки студентов и на сегодняшний день на первый план выходит технологическая компетентность.

Формирование процесса овладения образовательными технологиями в учебном процессе это длительный и многоаспектный процесс. Он затрагивает как изучение дисциплин профессионально-педагогического цикла, так и профильные дисциплины. Изучение теоретических основ современных образовательных технологий при изучении дисциплины «Педагогические технологии» в вузе находит продолжение в использовании и применении технологий в ходе учебной педагогической практики в учреждениях среднего профессионального образования.

Изучение дисциплины «Педагогические технологии» позволяет студентам освоить теоретико-методологические основы технологического подхода в профессиональном образовании, современными образовательными технологиями, методами и технологическими приемами обучения с использованием разнообразных форм работы (проблемных лекций, исследовательских проектов, самостоятельной работы в электронной

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teacher of vocational training. The paper presents the features and possibilities of the formation of competence in the possession of educational technologies of pedagogical University students. The author reveals the concept of technological competence, denotes its essence, defines the structural components of the process of mastering educational technologies.

Game, project, discussion, information and case technologies are presented as the main educational technologies for the future activity of the teacher of vocational training in the system of secondary vocational education.

**Keywords:** Competence, technological competence, vocational education teacher, student, professional competence.

образовательной среде, групповых дискуссий, выполнения практических заданий и кейс-стади).

Автором обоснована идея необходимости формирования технологической компетентности как неотъемлемого элемента в становлении современного педагога профессионального обучения. В работе представлены особенности и возможности формирования компетентности во владении образовательными технологиями студентов педагогического вуза. Автор раскрывает понятие технологической компетентности, обозначает ее сущность, определяет структурные составляющие процесса овладения образовательными технологиями. В качестве основных образовательных технологий для будущей деятельности педагога профессионального обучения в системе среднего профессионального образования представлены игровые, проектные, дискуссионные, информационные и кейсовые технологии.

**Ключевые слова:** компетентность, технологическая компетентность, педагог профессионального обучения, студент, профессиональная компетентность.

## Resumen

La formación de los educadores de la formación profesional se orienta a las necesidades de la sociedad en los especialistas competentes. Por lo tanto, las universidades pedagógicas tienen como objetivo mejorar la formación de los estudiantes y, hasta la fecha, la competencia tecnológica está en primer plano.

La formación del proceso de dominio de la tecnología educativa en el proceso de aprendizaje es un proceso largo y multidimensional. Afecta tanto el estudio de las disciplinas del ciclo profesional y pedagógico como las disciplinas de perfil. El estudio de los fundamentos teóricos de las tecnologías educativas modernas en el estudio de la disciplina "las tecnologías Pedagógicas" en la Universidad encuentra la continuación en el uso y la aplicación de las tecnologías en el curso de la práctica pedagógica en las instituciones de la enseñanza secundaria profesional.

El estudio de la disciplina "las tecnologías Pedagógicas" permite a los estudiantes asimilar los fundamentos teóricos-metodológicos del enfoque tecnológico en la educación profesional, las tecnologías modernas educativas, las técnicas y las técnicas tecnológicas de la enseñanza con el uso de las formas diversas del trabajo (las conferencias problemáticas, los proyectos de investigación, el trabajo independiente en el ambiente electrónico educativo, las discusiones grupales, la ejecución de las tareas prácticas y las etapas de estudio).

El autor ha fundamentado la idea de la necesidad de la formación de la competencia tecnológica como un elemento integrante en la formación del pedagogo moderno de la enseñanza profesional. El trabajo presenta las características y las posibilidades de la formación de la competencia en la posesión de las tecnologías educativas de los estudiantes de la Universidad pedagógica. El autor revela el concepto de competencia tecnológica, denota su esencia, define los componentes estructurales del proceso de dominio de la tecnología educativa.

Como las tecnologías básicas educativas para las actividades futuras del educador de la enseñanza profesional en el sistema de la enseñanza secundaria profesional son presentadas las tecnologías de juego, de proyectos, de discusión, informativos y de casos.

**Palabras clave:** Competencia, competencia tecnológica, educación vocacional docente, alumno, competencia profesional.

## Introduction

The main goal of modern higher education is dictated by the needs of the state and society (Garnevska et al, 2018). Based on the conditions of a competency-based approach, it consists in preparing a competitive graduate capable of operational orientation in changing professional conditions, to the non-standard solution of emerging problems (Ihnatenko et al, 2018).

The society today needs highly educated competent teaching staff capable of designing the educational process using modern educational technologies (Klinkov et al, 2018). Providing a high level of training for vocational education teachers is achieved through the formation of competence in the possession of modern educational technologies (Kutepov et al, 2017).

The technological component of the professional training of students of a pedagogical university is an element necessary for the development of professional education (Makhometa et al, 2018).

A vocational education teacher prepares for teaching in the secondary vocational education system (Markova et al, 2018). His competence, his knowledge of educational technologies make it possible on an active basis to form a competent mid-level specialist and improve the quality of professional education in general (Natalie et al, 2019).

The learning process should be creative, that is, including creative, design forms of activity, problematic, allowing students to independently develop ideas for solving tasks (Pometun et al, 2018). The process of technological competence formation includes these elements and makes it possible to deeply study modern pedagogical technologies (Smirnova et al, 2017). Competence in the possession of modern pedagogical technologies in the training of teachers of vocational training, contributes to their formation, professional and personal development and is a condition for improving the quality of training of specialists in the field of secondary vocational education.

## Theoretical basis

The development of the competency-based approach in the field of higher education in the Russian Federation has been going on for a long time, therefore a lot of works have appeared on this issue (Smirnova et al, 2018). Today, a lot of attention is paid to the problems of professional competence. However, the topic of the formation of technological competence as a subject of

special research is not yet as frequent and not fully explored (Vaganova et al, 2018). Despite this, technological competence is revealed in the works of such scientists as G.K. Selevko, I.A. Winter, V.P. Bepalko, M.V. Clarin, V.S. Zaitsev, V.A. Adolf, L.G. Antropova, A.V. Khutorskoy, A.Yu. Petrov.

The concept of technological competence is considered as an integrative characteristic, which manifests itself in aspirations and abilities to realize one's own potential, consisting of personal qualities (the ability to self-control, self-education, critical thinking, perseverance) and the possession of pedagogical technologies, the ability to use them in professional activities (Vaganova et al, 2017a).

Many scientists include in the concept of technological competence the ideas of efficiency, effectiveness and high productivity of the activities of a vocational education teacher with this competency (Vaganova et al, 2017b). Besides, technological competence combines theoretical and practical student training (Zhytikhina et al, 2017).

The process of technological competence formation includes several types of activities: socio-cultural, design-creative, managerial-pedagogical, professional-pedagogical (Abramova et al, 2018).

Some researchers believe that technological competence is part of the professional competence of a modern teacher and interpret it as an integrative professional quality, characterized by knowledge of technologies, methods, tools, forms of activity and the conditions for their application, organizations where creative, design and analytical skills are manifested. Reflexive positioning is also shown about the results of one's activities (Bartkiv et al, 2018). The concept of "technological competence" also includes the subject's ability to algorithmize his activities, that is, to understand, assign and implement a particular technology (Bulaeva et al, 2018).

In technological competence, two substructures can be distinguished: activity (knowledge, skills, abilities, and ways to carry out professional activities); communicative (knowledge, abilities, skills and ways of communicative interaction in the educational process) (Chirva et al, 2018).

Most authors agree that the structure of technological competence consists of motivational-value, professional-activity, evaluative-reflective and representative components (Denysenko et al, 2018).

The motivational-value component is directed to characterizing the students' internal needs for the implementation of future professional activities based on continuous improvement. The professional-activity component includes the formation of the subjective position of the future teacher, based on his ability to make independent, responsible decisions, in conditions close to the real professional pedagogical activity, as well as on the planning and implementation of actions that contribute to the rational and successful achievement of goals.

### **Methodology**

Our study involved 2 groups of students of the Kozma Minin Nizhny Novgorod State Pedagogical University, students in the field of "Law and Law Enforcement" and "Construction". In the process of their preparation, various educational technologies were used to form their competence.

Game, project, discussion, information and case technologies are presented as the main educational technologies for the future activity of the teacher of vocational training in the system of secondary vocational education.

Having formed theoretical knowledge on the issue under study, students need to apply them in the real educational process and acquire practical skills. Practice plays a large role in building competencies in the possession of educational technologies. In practical classes, the ability to design classes, didactic materials for them and assessment tools based on the use of the studied technologies is formed.

When studying the discipline "Pedagogical technologies", the following methods are used: discussions, the implementation of educational research tasks, the use of electronic educational systems, the discussion of problems in micro-groups, student presentations in the form of presentations on topics within the framework of studying individual topics (for example, "Classifications of pedagogical technologies", "Types of pedagogical technologies", "Author's pedagogical technologies").

Students also prepare essays on the topics: implementation of critical thinking technology in the study of special disciplines in a professional college (university); the implementation of the technology of problem education in the study of special disciplines in a professional college (university); implementation of interactive technologies in the study of special disciplines in a professional college (university); implementation of personality-oriented technologies in the study of special disciplines in a professional college (university); implementation of case study technology in the study of special disciplines in a professional college (university); Implementation of discussion technologies in the study of special disciplines in a professional college (university); implementation of technology for project activities of students in the study of special disciplines in a professional college (university); information technology in vocational training; multilevel education technologies (Firsov V.V., Pikan V.V. ; Technologies for collective mutual learning (Rivin A.G., Dyachenko V.K.); technologies for the complete assimilation of knowledge (B. Blum, J. Carroll, Monks V.M. .); the method of sign-contextual learning according to A. Verbitsky; development of students' personal qualities by means of the subject: technological approach.

The organization of project activities is as follows. Students are divided into 5-6 people, the teacher issues a task. In the process of active interaction with each other, students prepare lesson projects (studying copyright technologies). In this process, they use many technologies: for example, interactive, information technology, critical thinking technology, research, game learning.

The development of training projects - as one of the options for mastering this competency, allows future teachers of vocational training to become more confident in the use of technologies and prepare for future professional activities.

### **Analysis**

The formation of competence in the possession of modern educational technologies takes place based on several approaches: systemic, active, personality-oriented, competency-based.

A systematic approach to the formation of technological competence ensures the integrity and structure of the process, the interconnection of elements.

The active approach represents the student as a subject of independent educational and cognitive activity. The formation of competency occurs in the process of the student's activity, in the process of self-selection of information, the search for solutions to the problems posed.

The personality-oriented approach is aimed at the personality of the student, is addressed to his individual experience and needs, is based on self-actualization of the personality and encourages the student to develop in the process of learning the internal potential for personal growth.

Based on the competency-based approach, we identify the basic concepts and positions on which it is necessary to rely on the process of forming competence in the possession of technologies.

There are so many educational technologies. Modern authors distinguish more than two thousand. In the whole variety of approaches and classifications of technologies, it is difficult to navigate, to choose the most suitable ones necessary for the formation of professional competencies.

Training by profession requires the inclusion of students in active search practice-oriented activities. Accounting for future professional activities is an important factor in the choice of educational technologies.

We highlight the implementation of information, gaming, discussion, design, case technologies.

Mastering educational technology is a complex, lengthy process that requires the use of a variety of activities.

Having formed theoretical knowledge on the issue under study, students need to apply them in the real educational process and acquire practical skills. Practice plays a large role in building competencies in the possession of educational technologies. In practical classes, the ability to design classes, didactic materials for them and assessment tools based on the use of the studied technologies is formed.

The formation of technological competence is carried out in the process of studying various disciplines.

At a pedagogical university, students master educational technologies both in the study of psychological and pedagogical disciplines, as

well as in the study of specialized disciplines in law and law enforcement, economics and management, service, construction. We will follow the formation of competence in the possession of educational technologies on the example of the discipline "Pedagogical technology".

The discipline "Pedagogical technologies" refers to the basic part of the comprehensive module "Methodology and theory of professional-pedagogical systems", its purpose is to develop the ability and readiness of the graduate to master the theory and design models of pedagogical technologies in the pedagogical process, pedagogical system, pedagogical activity. The tasks of the discipline include: - the formation of an understanding of the role and place of pedagogical technologies in professional-pedagogical activity;

- Awareness of the characteristics of models of educational technologies and the acquisition of skills in the development of its individual components;
- Familiarization of students with the areas and boundaries of the application of vocational training technologies;
- Practical development by students of the methods and techniques for the implementation of vocational training technologies.

In the study of the topics "Technological approach in education", "The concept of pedagogical technology, subject, object, implementation result"; "History of the development of pedagogical technologies"; "Pedagogical technology and teaching methods"; "The didactic process is the basis for the development of pedagogical technology", "Structural and content characteristics of pedagogical technology" are used both theoretical and practical tasks.

With the help of theoretical tasks, the assimilation of theoretical concepts and understanding of the scientific foundations of professional activity are verified. The ratio of simple and complex theoretical tasks and their quantity sufficient to certify each student is regulated.

At the same time, the requirements of the competency-based approach about the problematic nature of tasks, their focus on a comprehensive verification of achievements, and

the formation of competence are taken into account. Simple theoretical tasks involve a solution in one or two actions: test tasks with an answer in a closed form, to establish compliance or restore the sequence; simple questions with a short answer. Complex theoretical tasks involve the separation of information into interdependent parts, identifying the relationships between them, interpreting the results, creative transformation of information from different sources; making judgments about the integrity of the idea, method, theory based on insights into the essence of the phenomena and their comparison.

Practical tasks can be formulated as a task, case, game (imitation) situation.

In the process of studying the discipline, students complete assignments in both individual and group forms. In the case of using the group form, individual contribution and individual achievements of each participant are evaluated.

When studying the discipline "Pedagogical technologies", the following methods are used: discussions, the implementation of educational research tasks, the use of electronic educational systems, the discussion of problems in micro-groups, student presentations in the form of presentations on topics within the framework of studying individual topics (for example, "Classifications of pedagogical technologies", "Types of pedagogical technologies", "Author's pedagogical technologies").

In the process of studying each topic, students prepare messages and reports.

The subject matter is quite broad: the technology of instruction. Traditional and non-traditional technologies; characteristics of information technology; personality-oriented technologies; interactive technologies; level differentiation technologies; technology of individualization of education; features of parenting technology; the use of gaming technology in the educational process; the concept of pedagogical excellence and its components; essence, types and stages of solving pedagogical problems; diagnosis and design of the pedagogical process; features of the planning of the pedagogical process at school; educational and cognitive activity and the technology of its organization; sports and fitness technologies; technologies of collective creative

activity; technology of pedagogical communication.

Students also prepare essays on the topics: implementation of critical thinking technology in the study of special disciplines in a professional college (university); the implementation of the technology of problem education in the study of special disciplines in a professional college (university); implementation of interactive technologies in the study of special disciplines in a professional college (university); implementation of personality-oriented technologies in the study of special disciplines in a professional college (university); implementation of case study technology in the study of special disciplines in a professional college (university); Implementation of discussion technologies in the study of special disciplines in a professional college (university); implementation of technology for project activities of students in the study of special disciplines in a professional college (university); information technology in vocational training; multilevel education technologies (Firsov V.V., Pikan V.V.); Technologies for collective mutual learning (Rivin A.G., Dyachenko V.K.); technologies for the complete assimilation of knowledge (B. Blum, J. Carroll, Monks V.M.); the method of sign-contextual learning according to A. Verbitsky; development of students' personal qualities by means of the subject: technological approach; problem-based learning technologies as a means of developing students' critical thinking; interactive learning technologies - an effective means of developing students' reflexivity; modern educational technologies of education as a factor in improving the quality of the educational process; information technology of education and the quality of education; the influence of personality-oriented technologies on the achievement of compulsory learning outcomes by each student.

In the process of developing competence in the possession of educational technologies, electronic systems are actively used. Electronic educational systems are used both in the classroom and in the course of students' independent work.

Figure 1 shows the process of students using electronic resources in a practical lesson in the discipline "Pedagogical technologies".

Figure 1. A practical lesson in the discipline "Pedagogical technologies"



Discussions have an active positive influence on the formation of the competency we are considering. An active discussion of the issue makes students more deeply perceive the information and, as a result, better absorb it.

The study of the discipline involves the use of gaming and design technologies. When studying the discipline "Pedagogical technology", students complete the project. At the end of the

study, the final section "Technological compactness of the teacher" students present their work in the audience.

The organization of project activities is as follows. Students are divided into 5-6 people, the teacher issues a task. In the process of active interaction with each other, students prepare lesson projects (studying copyright technologies). In this process, they use many technologies: for example, interactive, information technology, critical thinking technology, research, game learning. Figure 2 shows the process of protecting projects in the final lesson.

Figure 2. Protection of projects in the discipline "Pedagogical technology"



The process of mastering pedagogical technologies is complex and multidimensional, therefore, in the formation of technological competence is accompanied by a large number of forms of activity, during which students learn the independent use of educational technologies.

The development of training projects - as one of the options for mastering this competency, allows future teachers of vocational training to become more confident in the use of technologies and prepare for future professional activities.

### Conclusions

The use of various technologies in the training of teachers of vocational training contributes to the active formation of competence in the possession of modern educational technologies in a university. The combination of practical and theoretical training allows students to better study the material. Implementation and protection of the project has a positive effect on the formation of student competence. The formation of competence in the possession of educational technologies is one of the innovative ways to improve the quality of education in secondary vocational schools.

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