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DEVELOPING TECHNOLOGICAL COMPETENCE IN FUTURE PRIMARY TEACHERS BASED ON STEAM EDUCATION

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Abstract: This article analyzes the need to use STEAM educational technology in natural science lessons in primary grades, ways to improve the methodological training of teachers, and issues of developing students' creative and logical thinking in an innovative educational environment.
Key words: STEAM , natural sciences , methodology , integration , creative thinking , technological approach , innovative education .

Technological competence plays a key role in the work of a primary school teacher, as it directly affects the quality of the educational process and the successful functioning of students in the modern world.
In the digital age, where technology is penetrating all aspects of human life, teachers need to know how to integrate these tools into their practices to make the learning process more effective, interesting, and convenient for children.
One of the most important aspects of technological competence is the ability of a teacher to use technology to enhance the quality of the learning process. This not only allows for diversification of the ways in which educational materials are presented, but also creates conditions for increasing the opportunities for different categories of students to use them. With the help of digital resources such as interactive whiteboards, multimedia presentations, applications and platforms, teachers can adapt the learning process to the individual characteristics of each child, which is especially important in the primary grades, because at this stage children are just beginning to develop their knowledge and cognitive abilities. Technologies allow the teacher to provide visual and understandable examples, which helps to better assimilate the material.
Technological competence increases the efficiency of managing the educational process. With the help of digital tools, it is possible to easily organize and control the activities of students, monitor their development, establish feedback, and adapt educational tasks depending on the level of readiness of children. This is also very important in inclusive education, as technology is considered a key factor in ensuring equal access to knowledge for all students.
In addition, the use of technology helps children develop the most important skills of the 21st century. A teacher who is technologically competent not only helps students master subjects, but also develops their information literacy, critical thinking, problem-solving and teamwork skills. Modern technologies allow children to create tasks that require active participation, independent search for solutions, and interaction with other students.
A teacher's technological competence is also related to his or her ability to critically evaluate the use of technology in the educational process. The teacher must understand which tools truly

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support learning and which tools may be distracting or not effective enough. Due to the constant development of technology, this requires teachers to constantly improve their knowledge and skills, as well as to continuously work on themselves.

The technological competence of a primary school teacher is not only the ability to use modern digital tools, but also a set of knowledge, skills and abilities that help create favorable conditions for children's learning. This increases the adaptability and efficiency of the educational process, as well as meets the problems of modern society and the needs of students.

The technological competence of future primary school teachers is an important part of their professional development, serving as the basis for their successful activity in the conditions of the modern educational process. In a world where technology is rapidly developing and becoming an integral part of daily life, teachers must not only have the necessary technical skills, but also understand how to effectively use these tools to improve the quality of education. These future teachers must be able to adapt the educational process to the needs of the digital generation, and through the use of digital resources, they must develop both subject knowledge and critical thinking, creativity, and independence skills in children [1].

Technological competence includes not only the ability to use modern hardware and software, but also an understanding of how technology can impact various aspects of the educational process, implement interdisciplinary learning, and increase student engagement in learning. It is important for teachers to be aware of the power of technology in creating an inclusive learning environment that equally shares the learning process for all students.

Developing technological competence also includes being aware of the ethical aspects of using technology, including issues of privacy, security, and critical thinking [88].

Learning to use modern technologies is a key aspect of preparing future primary school teachers, as it directly impacts their ability to create effective learning environments. In the digital age, teachers need to not only master technical tools, but also understand the possibilities for solving pedagogical problems. This knowledge allows us to use technology to facilitate the learning process, making it more convenient, interesting, and effective [2].

First, the future of educators lies in understanding how to integrate various technologies into the educational process. This is not just about using gadgets and apps regularly, but rather a deep understanding of how each digital tool can enhance the learning process. Modern technologies open up vast opportunities for teachers, as they help individualize the learning process, take into account the individual needs of each student, offer different approaches to presenting educational materials, and also ensure the active involvement of children in the learning process. Knowing how to use interactive task creation programs helps teachers develop materials that facilitate students' interaction with the learning material. This not only simplifies the learning process, but also makes it more interesting and comfortable. Technology also helps manage the

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2. [2] Voinova , O.I., Pleshakov, V.A. Cyber-ontological approach in education. Monograph / Edited by V.A. Pleshakov. – Norilsk: Norilsk Industrial Institute, 2012

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learning process, making it easier to organize lessons and track the development progress of each student [3].

In addition, online learning platforms that provide free access to learning materials outside the classroom play an important role in the modern learning environment. This expands the possibilities of the educational process by offering additional resources and tasks for independent learning, as well as creating conditions for students with different levels of knowledge to move at their own pace.

For a future teacher, knowing how to use modern technologies is not just a specific set of skills, but an important component of professional competence, without which it is impossible to imagine an effective and relevant educational process in a digital society [100].

The ability to apply technology to educational activities is considered one of the most important skills of a future teacher, because having knowledge about educational technologies and tools does not guarantee their effective use in the educational process. The successful use of technologies requires the ability to select and integrate them in a way that meets specific pedagogical goals, taking into account the age and psychological characteristics of future students.

Each digital tool should be adapted to the developmental level of children and facilitate their learning in a convenient and interesting way. To do this, the teacher must understand how technologies can affect the development of students' cognitive, creative and communicative abilities. For example, in primary school students, simple visual images or interactive It is necessary to use materials that help students understand complex information through tasks. The use of technologies such as interactive games, virtual laboratories, and educational applications not only makes the learning process more interesting, but also expands the possibility of using different cognitive channels to develop students' educational activity [105].

An important aspect of the adaptation process is the selection of tools aimed at developing creative thinking. Elementary school students are naturally inclined to experiment and explore, so technologies should provide them with opportunities for self-expression, discovery, and innovation. Drawing, multimedia design programs, or simple coding tools help students develop creative approaches to problem solving and learn to find innovative ways to complete tasks [32].

Technology also plays an important role in developing communication skills. Most digital platforms allow students to engage in group learning activities to communicate, discuss, and solve problems together. Using such tools helps develop skills such as communication, teamwork, critical thinking, and debate.

The ability to apply technologies to educational activities requires not only technological literacy from the teacher, but also deep methodological preparation. The future teacher must know how to use technologies in a meaningful and creative way, so that they become a tool that improves the quality of the educational process and contributes to the all-round development of students.

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3. [3] Shodiyeva M. J. Start ' ich class his teachers professional development scientific - pedagogical aspects // Modern education / Sovremennoye image – 2021. – No. 4 (101). - B. 58–64.

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Pedagogical knowledge is an integral part of technological competence, and technology should not only be present in the educational process, but also contribute to the achievement of pedagogical goals. Future primary school teachers should understand the importance of technology in achieving these goals by making the educational process more dynamic and individualized. Technology allows teachers to create a variety of learning scenarios that meet the needs of each student and help them develop their skills and abilities .

One of the main aspects of using technology is the organization of interactive lessons. Modern digital tools allow you to involve students in the learning process and create conditions for their active use of educational materials. Interactive whiteboards, learning platforms, and various applications teach students not only to passively absorb information, but also to use it productively, to participate in discussions and solve problems by researching, asking questions. This helps to increase children's activity and more deeply assimilate knowledge.

Creating multimedia materials is another important component of technological competence. Future teachers should know how to use visual and audiovisual resources to make educational materials more understandable and accessible. Multimedia presentations, video tutorials, interactive maps and diagrams allow for a visual presentation of complex topics, which is especially important for primary school students who perceive information more easily through images, sounds and dynamic elements [«Pedagogicheskaya tekhnologiya obucheniya, osnovannaya na principakh urovnevoy differentsiatsii». M.R. Kovjasarova. Almaty. 2003].

Technology also plays an important role in the assessment process. Online testing and other forms of digital assessment allow teachers to quickly and efficiently check students' knowledge levels through real-time feedback. This not only facilitates the assessment process, but also helps the teacher adjust the curriculum based on test results and adapt it to the capabilities of students.

In addition, technology significantly expands the possibilities for an individual approach to the learning process. With the help of digital tools, the teacher can create tasks with varying degrees of difficulty, adapting them to the abilities and interests of each student. Individualized learning trajectories allow students to move at their own pace, review material when needed, or deepen their knowledge in areas of particular interest to them.

Pedagogical knowledge within the framework of technological competence is the ability to use digital tools to create an engaging, interactive, and personalized learning process.

Skills for critically evaluating the potential of technologies are an important component of teachers' technological competence, as they help teachers take a meaningful approach to selecting effective tools for the learning process. In the modern world of abundant digital resources, it is important not only to have the skills to use technologies, but also to evaluate their effectiveness and relevance from the point of view of specific pedagogical tasks. The teacher should assess [4]the extent to which technologies support learning and the importance of ensuring that they are non-distracting and useful .

Critical evaluation of technologies begins with an understanding of their pedagogical significance. The primary school teacher should understand that learning to use technologies is

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4. [4] Abdug ' opporova S. D. Future in educators technological competence formation paths : graduation qualified Job : 5110900 – Pedagogy and psychology direction . – Namangan , 2018. – 56 p .

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not the main goal, but rather a means to achieve educational goals, since not all digital resources are suitable for use in the educational process. For example, interactive games and apps can be useful for motivating and engaging students, but their use must be justified in terms of highlighting the content of educational materials and the targeted competencies.

Another aspect of critical evaluation of technology is its impact on the attention and concentration of primary school students. In an era of digital resources, there is a risk that some technologies will distract students from the main material. For example, excessive use of bright visual effects or fun elements can reduce concentration and prevent deep understanding of the subject. The teacher must be able to distinguish when technologies can help focus attention on learning tasks and, conversely, when they can distract students.

It is important to consider the age and readiness of students when selecting technology, as information that is appropriate for older students may not always be appropriate for younger students. Teachers must be able to evaluate not only the content but also the way in which the material is delivered through technology to ensure that it is appropriate for the cognitive and emotional needs of children of each age group.

CONCLUSION

The modern education system is aimed at developing students' personal potential, forming skills to apply knowledge in life, and expanding opportunities to demonstrate personal competence. In this process, primary school teachers play a leading role, as they are considered the ones who create the foundation of the future generation. For this reason, the need to develop teachers' technological competence must have a strong scientific and practical basis.

Today, the development of technological competence of primary school teachers is one of the urgent issues of the education system. This competence includes the skills necessary for the effective use of modern technologies in the educational process, the application of interactive methods, and the formation of scientific and technical thinking in students. The technological competence of primary school teachers is a factor that plays an important role in organizing the educational process in a more qualitative and meaningful way, and in educating students as competitive and multifaceted individuals in the future.

Primary school teachers need to develop sufficient knowledge, skills and abilities to use technological solutions in their work. This competence has become an integral part of the modern educational process, serving to improve the content and quality of education. The technological competence of a teacher includes not only the use of technological tools, but also their use in achieving didactic goals.

The STEAM (Science, Technology, Engineering, Arts, Mathematics) approach to education is particularly important in this process. STEAM education helps students increase their technological literacy by connecting theoretical knowledge with practice, encouraging them to think in multiple directions, and encouraging creativity. The STEAM approach to developing technological competence in primary school teachers ensures interdisciplinarity, encourages teachers to use new pedagogical technologies, and integrates scientific and practical knowledge. At the same time, it increases the effectiveness of the teacher's professional activity and strengthens students' interest in technology and science.

In conclusion, developing the technological competence of primary school teachers and supporting the STEAM teaching approach will help shape a competitive, creative, and technologically advanced generation in the educational process.