

Innovative Technologies as a Means of Forming the Professional Competence of Elementary School Teachers of the New Ukrainian School (NUS)

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Abstract: *The article deals with innovative technologies as a way to form the professional competence of elementary teachers of the New Ukrainian School. The relevance of the article lies in the fact that now in order to educate co-educators, a teacher needs to form professional competencies (to be a mentor, a coach, a tutor, an innovator, a facilitator).*

The purpose of the article: to clarify the meaning of the concepts of "pedagogical technology", "innovative pedagogical technology", "competence", "professional competence"; to analyze articles and publications on the need to implement innovative technologies in the educational process; to consider the meaning of digital competence and professional competence for teachers.

Methods of work: analysis of scientific literature, system analysis.

Results: as the research on the issue shows, the professional competence of the teacher is based on the fundamental knowledge of the basic subject, general culture and thorough didactic competence. Currently, teachers should develop in children critical thinking, communication and technical skills, emotional intelligence, analytical abilities, taking into account the age characteristics and physical condition of the child.

Novelty is a key competence of every teacher, which is life-long learning.

Conclusion: the use of innovative technologies, psycho-pedagogical and basic knowledge is a complex necessary for the formation of professional competence of elementary teachers of NUS.

Keywords: *Pedagogical technology, teacher, methodology, innovation, competence, professional competence.*

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Introduction

The relevance of the article is that an elementary school teacher should be motivated, who has freedom of creativity and develops professionally. A self-improving and developing teacher uses innovative approaches and technologies in teaching, does not criticize the child, but helps him to develop and learn, supports, uses innovative practices. Consequently, in order to build professional competencies, teachers need tools with which to be motivated in their daily teaching activities (Berbets et al., 2021; Karasievych et al., 2021; Kosholap, et al., 2021; Melnyk et al., 2021; Melnyk et al., 2019). Dmytrenko (2020) presented a competency scheme for the today's New Ukrainian School teacher: mentor (a mentor willing to share experience); coach (helps achieve goals); tutor (forms a holistic personality); innovator (uses the latest technology and practices); facilitator (provides group work).

The purpose of the article: to clarify the meaning of the concepts of "pedagogical technology", "innovative pedagogical technology", "competence", "professional competence"; to analyze the literature, which presents articles and publications on the need to implement innovative technologies in the educational process; to consider the meaning of forming digital competence for teachers; prove the meaning for the New Ukrainian School teacher professional competence.

To begin with, let us consider the essence of the concepts of "pedagogical technology", "innovative pedagogical technology", "competence", "professional competence".

According to Androsova (2010, p.29), "educational technology - a separate branch of pedagogical science of development, education, training and education of the student's personality on the basis of socially significant universal qualities and achievements of psychological and pedagogical thought and the foundations of computer science.

According to Pometun (2004, p. 141), "pedagogical innovation is the process of creating, distributing, and using new tools (innovations) to solve those pedagogical problems that have been solved differently before".

According to Khymynets (2016 p.42), "innovative pedagogical technology - purposeful, systematic and consistent introduction into practice of original, innovative ways, techniques of pedagogical actions and tools, covering a holistic learning and educational process from the definition of its purpose to the expected results".

In the manual Bibik (2017, p. 202) gives an interpretation of the concept "competence - a set of personal qualities of the student (value -

semantic orientations, knowledge, skills, abilities), conditioned by the experience of his activity in a certain social and personal sphere. The student's ability to independently implement practical activities and solve life problems based on the acquired learning and life experience, personal values and abilities.

According to Banashko et al. (2022, Chapter 1), "competence means the range of powers of any person or body, possession of knowledge, experience in a certain area".

The Professional Standard for the professions "Elementary School Teacher of General Secondary Education Institution", "Teacher of General Secondary Education Institution", "Elementary Education Teacher (with Junior Diploma)" section 2 point 5, Petrashko, 2020, section 2, point 5) lists 15 professional competencies of a teacher. The subject-methodological competence is based on "the ability to select and use current and effective methods and technologies for teaching, educating and developing students" (Petrashko, 2020, p.7).

According to Banashko et al. (2022, Section 3) "professional competence is a basic characteristic of a specialist's activity; it includes both content (knowledge) and process (skill) components and has the main essential attributes, namely: mobility of knowledge, flexibility of professional activity methods and critical thinking". Professional competence of the teacher is based on pedagogical skill.

According to Ivanova (2008, p.110), professional competence is "the ability of a specialist from the beginning of his professional activity at the level of a certain standard defined by the state to meet the public requirements of the profession through effective professional activity and to demonstrate proper personal qualities, mobilizing for this purpose appropriate knowledge, abilities, skills, emotions, based on their own inner motivation, attitudes, moral and ethical values and experience, aware of the limitations in their knowledge and skills and accumulating other resources for their compensation".

By the way, professional competence of a teacher Banashko et al. (2022, Chapter 8) interprets as "the totality of his personal qualities, general culture and qualification knowledge, skills, methodological mastery, harmonious integration of which in pedagogical activity gives optimal results".

According to the Law of Ukraine "On Education" (2017, Article 18) adult education is a continuous professional development, that is "the continuous process of learning and improving the professional competence

of specialists after higher and/or postgraduate education, which allows the specialist to maintain or improve and last throughout his professional life.

Mandzhieva (2015) believes that the professional competence of an elementary school teacher should be multidisciplinary: psychological training should be integrated with all aspects of teaching into one educational space, which will focus on child-centeredness. This organization of activities will enhance professional competence and provide daily enjoyment in working with children.

According to Marfuga (2013), the formation of professional competence is facilitated not by students' awareness of the content of the material, but by solving certain situations: learning and explaining phenomena of reality, the process of learning modern information technology, communication between people, evaluating their own actions, performing certain social roles in practical life.

Consequently, the key competency of every educator is the key competency of lifelong learning.

The introduction of innovative technology is the key to successful learning

A review of studies by domestic and foreign authors proves that Pometun (2004), Khymynets (2016), Yurchenko (2020), Shkabarina, Rodrigues (2020), Muzafarova (2019), et al. worked on the problem raised.

Pometun (2004) guide is devoted to the study of innovation, analyzing in detail interactive teaching methods. The author notes that due to the development of science and technology, teachers have become motivators, inspirers in the intellectual and creative potential of students. The professional competence of the teacher in the postmodern era is based on fundamental knowledge of the basic subject matter, high general culture and thorough didactic competence. And not because of a large-scale outline or a considerable number of manuals. Pometun (2004, p.16) defines the difference between the concepts "technology" and "methodology", comparing "highly productive machine production and relatively inefficient manual labor".

Exploring in detail the professional competence of an elementary school teacher, Bereka and Halas (2018, p.25) identifies 5 criteria of professional competence of an elementary school teacher: general cultural, general professional, communicative, personal, self-development and self-education. In addition, the author deeply examines the goal, objectives, key components of professional competence of a primary education teacher. In addition, he presents a model of pedagogical competence. Special attention

is paid to innovative technologies - the implementation of the competency-based approach to learning. It should be noted that the author notes the key components of professional competence of the teacher: informative (ability to master ICT), communicative (ability to communicate with students, parents and colleagues), productive (ability to accumulate, generalize, make decisions); autonomous (ability to learn throughout life - self-development, self-education, self-determination, competitiveness, creativity), moral (the ability to live by the laws of morality), psychological (the ability to apply psychological knowledge in the organization of the educational process), subject (ability to promote children's motivation for active cooperation, learning; choose the right style, tone of communication, attentiveness, pace), social (ability to cooperate with others), mathematical (ability to possess numerical information). Consequently, the use of innovative technologies, psycho-pedagogical and basic knowledge is a complex necessary for the formation of professional competence of elementary teachers of NUS.

Khymynets (2016) notes that present-day teachers should motivate students to learn, promote independent learning of knowledge, the ability to learn throughout life.

The authors Shkabarina et al. (2020) emphasize that nowadays children of primary school age have huge differences from their peers of previous generations. The New Ukrainian School concept focuses on the main task of an elementary school teacher - the development of the child's competencies. To develop a child's creativity, the requirements for the teacher himself/herself are growing: he/she must solve different situations in an original and quick way; improve the educational process so that it is interesting for the child and motivates learning; generate new teaching ideas and create his/her innovations and share them with his/her colleagues. The authors assure that traditional teaching is inferior to innovative technology, because the latter is a pedagogical process that promotes creative learning of children, designed to introduce new methods, content, tools needed for coeducation. Implementation of innovative technologies - a purposeful, consistent, systematic process, covering a holistic educational and educational processes and based on the introduction of original, innovative ways, methods, actions, means. Features of professional competence of an elementary school teacher is a set of individual qualities (communicative, intellectual, volitional, emotional, moral, etc.); the ability to notice and originally solve pedagogical problems (communicative, organizational, methodological); pedagogical orientation of thinking; desire to show their individuality; the ability to overcome stereotypes, the rejection of "template"

thinking; the desire to create new ideas and implement them; the ability to implement innovative learning technologies" (Shkabarina et al., 2020, p.141).

In the article by Yalcin et al. (2011) the authors emphasize that effective use of innovative technologies motivates children to learn, helps them better understand new material, achieve success in learning, improves development skills for creativity. In addition, information technology makes the lesson interesting for children, saves time in the lesson, allows greater visualization of the material, etc.

Digital competence of elementary school teachers as a necessity in the current educational process

Cross-cutting formation of information - digital competence of the teacher we find in the study of Erdem (2011). The author emphasizes that now the Internet, computer technology at an incredible rate of development and the more powerfully penetrate the education system. Nowadays, distance learning, web meetings, online courses, websites with a variety of subject tasks, etc. - are the most common educational opportunities that educators cannot do without. As we can see, the Internet contributes to the fact that e-learning becomes attractive and necessary, because it is flexible in time and space and promotes global learning. Thanks to the knowledge of digital competence, educators can create and implement their own ideas, use someone else's methods, disseminate their patrimony.

In the article Yurchenko (2020) notes the relevant industries that will be common in the near future: artificial intelligence, cybersecurity, life sciences, manufacturing industry, energy industry. The author notes that current and future education applicants should develop critical thinking, communication and technical skills, emotional intelligence, analytical skills. To do this, teachers should use innovative technologies in their work. For example, the program Adobe Photoshop, applied to Photoshop and Adobe Spark with the help of information technology, will help educators to motivate a child to read. Writing and creativity, create an interesting presentation or infographic, make a poster or a handy template for a lesson outline. In addition, with the help of globisens.net you can create graphs, tables, certificates, certificates. In addition, it can be used in STEM projects: for example, to conduct studies on light and humidity of plants. This special software collects results in a table, summarizes, draws tables, conducts monitoring, and plans forecasts. The development of makeymakey.com is an original constructor, which will help to play a piano scale on bananas without using a musical instrument. "Classvr" - an interesting resource aimed at gaming. "Octagon.studio" - a methodology that is built on the addition of

reality. "Dendrive.me" - directions of STEM and engineering, which will help to invent the questions you are interested in. No less interesting resource "Sphero.com, littlebits.com" - a constructor. Which, while playing, will help children learn robotics, programming, physics, and electronics. "Aka.ms/inclusive BETT2020 will come in handy when working with children with special needs.

On the use of innovative technologies - visualization and online tools are explored in the article Kurvits et al. (2019). The authors argue that IMS LD, LAMS, and LESSON PLANNER are simple and easy for educators to use.

For the formation of professional competence of an elementary school teacher is important use of ICT, because in the postmodern era is frequent in the elementary school is online learning, caused by COVID -19 and "military operation" of Russia against Ukraine, launched February 24, 2022. Distance learning requires the teacher to have a thorough mastery of computer technology, that is, a high level of digital competence. The authors Ottestad et al. (2014) identify the basic benchmarks of digital competence and argue that they contribute to students' motivation to learn and engage children in self-education.

Separate aspects of improving the STEM learning experience in elementary schools through innovative technologies of the NEWTON project are explored by Mawas (2019). The challenge for educators now is to understand, to have knowledge of STEM - education, because children demand it. STEM is an educationally engaging environment for children, learning through play and new visual technologies such as augmented reality, virtual reality and virtual labs. Project NEWTON will present a new interactive video game about the solar system. The game project has been tested on Irish elementary school-aged children, and 90% of students confirmed that they learned the material well, they liked the game, promoting easy learning about stars, a collection of meteorites.

The authors of the article (Moreira & Pombo, 2017) emphasize that the daily use of innovative technology, in particular information and communication innovations, is important for the formation of professional competence of teachers. In order to disseminate the technology, the AGIRE project was experimented within the EDULAB program. In order to implement the project, 25 hours were spent for teachers. A workshop with practical exercises that contributed to the professional development of teachers and improved the pedagogical practice of teachers.

Rodrigues (2020) explores the integration of digital technologies in teacher education: an active teacher training model. The author proposes an

innovative training model developed to help educators use a flexible approach in the educational process, implement active learning strategies, develop skills and integrate digital technologies in the organization of distance learning.

The use of innovative technologies as a priority means for the development of professional competence of the teacher

Kovalchuk and Biryuk (2019) devoted to the study of the role of innovative learning technologies in the development of pedagogical excellence. " Current innovative trends in education open a wide choice of learning philosophy and ways of solving practical problems for the teacher of vocational training. There is a transition from learning facts to mastering the meaning of events, development of worldview, acquisition of skills of application in life of accumulated knowledge, which is possible in conditions of using such means of interactive technologies as games" (Kovalchuk & Biryuk, 2019, p. 265). The authors believe that innovative technologies and ways of teaching contribute to, motivate the teacher to develop professional competence. In their opinion, innovative technologies include training technologies; game technologies; methods aimed at communicativeness; teaching clear and interesting communication; types of discussions, lectures-press-conferences.

Professional competence of an elementary school teacher, according to Shkabarina (2020), is based on the ability to consider the age characteristics and interests of younger students; optimal selection of up-to-date teaching methods and techniques for effective learning; motivation to study subjects; versatility of the teacher, who quickly transforms from one field to another; generates ideas; organizes his activities for the best result. In addition, the authors note the following criteria of pedagogical creativity:

- cognitive (professional knowledge of pedagogical creativity, competence of innovative technologies for teaching primary school children);
- personal (divergent thinking, developed creative qualities (persistence, openness, self-confidence, resourcefulness, rejection of stereotypes, insight, associative thinking, developed intuition), adequate perception of criticism;
- motivational and emotional (inner motivation for professional self-development, self-improvement; positive attitude to the development of pedagogical creativity; application of innovative technologies;
- active (creative approach to solution of pedagogical tasks and situations; use of creativity in preparation for the lesson, extracurricular

work; communicative skills (ability to communicate with students and parents).

Consequently, present-day elementary school teachers must be specialists with a high level of pedagogical creativity, motivated for successful continuous self-development and self-improvement in order to be interesting for children and competitive in the labor market. Therefore, the development of skills of pedagogical improvisation, promotion of assertive behavior; trainings, interactive discussions, round tables, press conferences, joint lessons with teachers-practitioners, teaching workshops, competitions of pedagogical creativity, creative duels, group work forms, teaching cases of different levels of complexity; use of non-traditional forms of organization of educational activities, educational role-playing games, creative projects, portfolio method; "workbooks on professional discipline" will help in the formation of professional competence of elementary teachers of New Ukrainian School (Shkabarina et al., 2020, p.152).

We should pay attention to the article by (Cui & Zhang, 2021), which focuses on conducting training sessions on neuroscience for teachers. As we know, information and communication technologies provide teachers with the opportunity to update the educational process, to teach in a new way, because innovative learning technologies, tools and platforms contribute to this. And yet now teachers feel the limited knowledge about the activity of the children's brain, so the need for knowledge of neuroscience to improve and enhance the educational process. The authors note that new technologies in the field of neuroscience contribute to the activation of the right and left hemispheres of the brain. By the way, neuroscience is a branch containing a complex of knowledge of neuroscience, psychology and education, so it studies the secrets of the human brain and its influence on learning. If the teacher will pay attention to the child's heart rate, breathing, pupil, he will be able to understand the child's condition in time to help him learn. Teachers can review the educational process, taking into account the knowledge of neuroscience, and create an ideal, calm, harmonious atmosphere in the classroom environment.

Certain aspects of the professional development of the teacher of the New Ukrainian School are considered by Sydorenko (2018). The author notes that now the NUS elementary school teacher has alternative models for the formation of professional competence: formal and non-formal education.

As you know, the teacher can pass certification, for the successful completion of which will have a material improvement, as well as will implement and "disseminate among colleagues methods of competency-

based learning and new educational technologies" (Law of Ukraine "On Education", 2017, Article 51, paragraph 5.) . In addition, for the teacher of primary classes NUS from 01.02.2018 introduced a mandatory distance learning course "Online course for teachers of primary classes" (Professional Development Program, 2018), structured in 6 modules: the study of the State Standard of primary education, the organization of the classroom, familiarization with the methodology of competency-based learning, inclusive education, neuropsychology. During this course, the educator is provided with teaching materials as well as a set of accompanying materials and tools.

Muzafarova (2019) reflects on the planning of teachers' professional development. The purpose of professional development of teachers is to introduce innovative technologies based on data and arguments, which are practically applied in specific exercises, adapted in the educational environment, give results and successes. According to the author, professional development contains 3 main aspects: learning, that is, obtaining professional knowledge on pedagogy, basic subject matter and psychology; possession of educational methods, techniques, technologies, pedagogical ethics and sustainability. Consequently, effective professional development can be evaluated in three ways: planning, evaluation, and dissemination. One of the forms of teacher training is training, in which first there is a clear allocation of roles, responsibilities, collection of information, thorough analysis, reflection, and evaluation of the training conducted. To develop professional competence, a professional development scheme is needed, that is, a system that provides continuous learning and a detailed list of criteria.

Certainly, neither lack of experience, nor lack of qualifications, nor family obligations become an obstacle. Teachers approve of participation in conferences and trainings; issues of individual approaches to teaching and student behavior are relevant to them.

It is worth noting the publication of Schwarz & Kaiser (2019), the authors of which note that nowadays the central influential factor in education is the professional development of teachers, which contains the professional competencies of the teacher and achievements of students. In addition, the author divides the professional development of the educator into two aspects: the growth of the teacher from novice to expert; the conceptualization and evaluation of the professional competence of the teacher. Traditionally, the understanding that an experienced teacher, or expert, is a person who has considerable pedagogical experience, education, methodological developments, successes. Researchers emphasize that the

expert is characterized by automatism, while the beginner is characterized by the probability of mistakes.

Noteworthy is the publication of Shmyhol (2011), in which the author identifies the components of professional competence of a teacher:

- motivational (desire, talent, material encouragement, recognition in society);
- special-subject (formation of knowledge, abilities, skills on the basic discipline);
- psychological-pedagogical (ability, knowledge, experience in pedagogy and psychology);
- methodological or didactic (the use of innovative pedagogical methods, techniques, forms of work, technologies);
- personal (personal qualities: honesty, responsibility, decency, humanity, tolerance, etc.)
- communicative (ability to communicate, pedagogical partnership between students - parents - colleagues)
- organizational - managerial (organizer, leader, tutor, falsifier of the educational process)
- experimental-research (selection of methods, synthesis, analysis of results);
- "reflexivity and autonomy - self-education, self-analysis, self-motivation, self-assessment, self-criticism" (Shmyhol, 2011, p. 202).

Among the disadvantages that hinder the implementation of innovative methods for the formation of professional competence of teachers:

- the cost of professional development;
- lack of a system for conducting activities;
- "lack of institutional support, when often activities are planned without taking into account classes" (Muzafarova, 2019, p. 281);
- lack of motivation and desire for active participation in activities.

Thus, it can be argued that innovative technologies have all the tools for the development of pedagogical creativity.

Conclusions

Thus, the article notes that innovative technologies are one of the tools for the teacher to form the professional competence of the teacher of the New Ukrainian School. The considered question "Innovative technologies as a tool for the formation of professional competence of elementary teachers of NUS" is quite relevant for teachers.

Developed articles and publications of foreign (Muzafarova 2019; Rodrigues, 2020; Shkabarina et al., 2020) and domestic (Khymynets 2016; Pometun, 2004; Yurchenko 2020). Clarified the essence of the concepts: "pedagogical technology", "innovative pedagogical technology", "competence", "professional competence". It has been researched that professional competence of a teacher nowadays is based on fundamental knowledge of the basic subject matter, high general culture and thorough didactic competence. In addition, it is emphasized that in the postmodern era educators should develop critical thinking, communication and technical skills, emotional intelligence, analytical skills in the work with present and future applicants for education, because in the near future such areas will be relevant: artificial intelligence about life, manufacturing industry, energy. Undoubtedly, the knowledge of neuroscience is now necessary for educators.

Thus, the use of innovative technologies, psycho-pedagogical and basic knowledge is a complex necessary for the formation of professional competence of elementary teachers of NUS.

Consequently, novelty is the key competence of each teacher, which consists of lifelong learning.

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