# CHAPTER 2

# INNOVATIONS IN THE MANAGEMENT OF EDUCATIONAL INSTITUTIONS

## TRAINING A MODERN MATHEMATICS TEACHER: THE EXPERIENCE OF THE YURY FEDKOVYCH CHERNIVTSY NATIONAL UNIVERSITY

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Abstract. The article analyzes research on the issues of readiness of a modern mathematics teacher; the advantages of using innovative technologies over traditional ones by a teacher are presented. The purpose of the article is to substantiate the feasibility of training future mathematics teachers by introducing innovative technologies into the educational process of a higher education institution. Research methods include theoretical – analysis, synthesis, comparison, study of best practices and empirical – pedagogical experiment, expert assessment, testing, questionnaires. It is proven that the main function of innovative technologies is the direct inclusion of students in life itself and the implementation of the doctrine of "lifelong learning". It is determined that the use of innovations and the application of pedagogical innovative technologies in work is one of the components of the innovative competence of a mathematics teacher. The features of the formation of the readiness of future mathematics teachers for innovative pedagogical activity and the classification of pedagogical technologies that are implemented in their work are presented. The academic disciplines of the educational program of the specialty 014.04 «Secondary education (mathematics)» for the field of knowledge 01 «Education/Pedagogy», which is implemented at the Faculty of Mathematics and Informatics of Yuriy Fedkovych Chernivtsi National University, are considered. As a result of studying professionally oriented disciplines, a complex of innovative teacher competencies is formed. The integration of innovative technologies in mathematics teacher training at Yuriy Fedkovych Chernivtsi National University sets a benchmark for modern education. By fostering competencies such as digital literacy, critical thinking, and adaptability, the university prepares future teachers to navigate the challenges of contemporary classrooms effectively. These advancements contribute to the broader goal of creating a resilient, innovative, and capable educational workforce. Future research and continuous adaptation will further enhance the training process, ensuring alignment with global trends and local needs.

*Keywords: innovative technologies, interactive technologies, innovative competence, innovative activity of the teacher, mathematical education, pedagogical education, teacher training.* 

*JEL Classification: A 23, I 21, I 23, I 24 Formulas: 0; fig.: 0; tabl.: 1; bibl.: 14*  **Introduction.** The implementation of the goals and objectives of high-quality training of modern mathematics teachers necessitates the search for ways and means to improve their university training, which is an important link in the formation of the personality of a future specialist and his further development. Mathematical education occupies a prominent place and is of particular importance in the system of general, professional and higher education. Its role, according to A. Kuz'mins'kyy (2009), «is determined by the influence that the process of mastering mathematical knowledge and methods of activity has on the formation and development of the general culture of modern man».

In the conditions of rapid changes in modern society, the use of only traditional technologies in education is not effective enough. Therefore, there is a need to develop new – innovative ones.

The use of active and individual approaches to the training of future specialists reveals the main function of innovative technologies – the direct inclusion of students in life itself and the doctrine of «lifelong learning». The use of only traditional technologies, passive and general teaching methods mistakenly spreads the idea of the ability of the education system to fully prepare future specialists for life.

**Literature Review.** The professional training of modern mathematics teachers has been a focus of both Ukrainian and global educational research, emphasizing the integration of traditional teaching methods with innovative technologies. This duality reflects the need to prepare teachers who can address diverse student needs and rapidly evolving technological landscapes.

Theoretical foundations for the training of mathematics teachers are rooted in the works of scholars such as Akulenko, Tarasenkova, and Burda, who highlight the necessity of robust subject knowledge, methodological competence, and pedagogical skills. According to Kuz'mins'kyy et al. (2009), the scientific principles of teacher preparation focus on developing the ability to design and deliver effective lessons by blending fundamental mathematics with real-world applications. This aligns with the findings of Achkan (2015), who emphasizes innovative pedagogical activities as a prerequisite for modernizing education.

At Yuriy Fedkovych Chernivtsi National University, the educational programs for future mathematics teachers—spanning bachelor's to master's levels—incorporate comprehensive syllabi designed to integrate theoretical knowledge with practical teaching applications. Programs such as "Mathematics and Informatics" outline key competencies that align with global standards, including curriculum development, digital literacy, and pedagogical innovation (Chernivtsi National University, 2024).

The integration of information and communication technologies (ICT) in teacher training is extensively discussed in the works of Spivakovsky and Rakov. These scholars argue that digital tools enhance interactive learning, making mathematics more accessible and engaging. Similarly, Dychkivska (2004) explores innovative pedagogical technologies, which are now central to many Ukrainian university curricula, including those at Chernivtsi National University.

Chernivtsi University's focus on cloud technologies and ICT-based teaching methodologies, as reflected in its syllabi (2024), aligns with global trends. Nicholls

(2006) and Angelovsky (2008) further assert that the ability to utilize digital tools is essential for teachers aiming to foster critical thinking and problem-solving skills in their students.

A competence-based approach has become the cornerstone of teacher education programs worldwide. Ukrainian researchers such as Kremen and Nychkalo emphasize that mathematics teachers must develop both general competencies, such as communication and collaboration, and specialized competencies, including advanced mathematical problem-solving and curriculum adaptation. These principles are embedded in the programs at Chernivtsi National University, which aim to produce well-rounded educators capable of addressing diverse classroom challenges.

Despite the advances in teacher training programs, challenges remain. Researchers like Mykhalin (2018) point out the difficulty of balancing theoretical rigor with practical application. Similarly, Khyt (2018) highlights the need for pedagogical institutions to adapt to the rapid pace of technological change while ensuring that future teachers retain a strong foundation in traditional teaching methods. The programs at Chernivtsi National University seek to address these challenges by offering interdisciplinary courses that bridge these gaps.

The training of modern mathematics teachers at Yuriy Fedkovych Chernivtsi National University reflects broader trends in educational innovation and teacher professionalization. By integrating foundational mathematics with advanced pedagogical strategies and digital technologies, the university ensures its graduates are equipped to meet the demands of contemporary education. This approach, informed by both Ukrainian and global research, underscores the importance of continuous adaptation and interdisciplinary learning in teacher training.

Theorists and practitioners agree that a mathematics teacher must have appropriate fundamental scientific training (knowledge, skills and abilities in the field of a specialized subject); possess methods of scientific knowledge of mathematics; have general and specialized competencies and be able to combine traditional and innovative technologies at different stages of the educational process.

**Aims.** The purpose of the article is to substantiate the feasibility of training future mathematics teachers by introducing innovative technologies into the educational process of a higher education institution.

**Methodology.** Research methods include theoretical – analysis, synthesis, comparison, study of best practices and empirical – pedagogical experiment, expert assessment, testing, questionnaires.

**Results.** Mathematics and mathematical education in modern conditions play a special role in the formation of a competent personality, capable of self-improvement and self-education throughout life. Only a competent mathematics teacher can form such a personality, aimed at improving the educational process, armed with knowledge of a wide range of modern pedagogical technologies, the ability to choose the most effective of them, taking into account the characteristics of the students and their capabilities. An important problem is the development of theoretical foundations for the creation of pedagogical innovations and the systematic implementation of innovative pedagogical activities by a mathematics teacher.

The introduction of innovative technologies into the educational process is primarily associated with the modernization of the education system and is aimed at ensuring openness of the educational process, development of abilities necessary for future mathematics teachers to make informed decisions, being active and mobile in the labor market. Innovative learning should meet the needs of the present, be oriented towards the development of the student as a person and contribute to the professional training of the future specialist. Such learning includes involving students in active educational and cognitive activity. In order to ensure greater effectiveness of practical classes on mathematics teaching methods, in addition to traditional learning technologies, interactive ones should also be used. Interactive learning technologies are aimed at positive interaction between the teacher and students and their equality as subjects of the educational process, students' interest in the learning process, assimilation of knowledge, development of communicative qualities and abilities, activation of their cognitive activity.

I. Dychkivska (2004) includes awareness of innovative pedagogical technologies, proper mastery of their content and methodology, a high culture of using innovations in educational work, and personal conviction in the need to use innovative pedagogical technologies among the components of a teacher's innovative competence.

The formation of the readiness of future mathematics teachers for innovative pedagogical activity is an objective process of their purposeful preparation for the creation and implementation of educational innovations. This process, according to A. Achkan, is based on the following principles:

1) adaptation of students to studying in higher education institutions, implementation of the principle of continuity between high school and university, formation of students' motivation for professional activity;

2) maximum use of innovative methods in the process of studying the disciplines of the mathematical cycle, giving the students' educational process a creative, innovative character;

3) deepening the integration of psychological, pedagogical and professional knowledge of future mathematics teachers; fundamentalization of training taking into account the specifics of the mathematics teacher's activities; application of innovative information technologies in the educational process;

4) using the systemic principle of training future specialists to design, create and partially verify models of the work of a mathematics teacher in the form of a general scheme of activities in implementing the educational process, the basis of which is the predominant activity of students, organized and created by the teacher;

5) development and application of «prognostic acmeological training» of future mathematics teachers to innovative pedagogical activities (Dychkivska, 2004). The predictive nature of this training means its orientation to the school of the future, taking into account the main trends in the development of mathematics teaching technologies. Its implementation on a contextual basis involves the coordinated use of all types of training of future mathematics teachers: propaedeutic, basic mathematical, general pedagogical, methodological and special (Achkan, 2015).

In our opinion, at the stage of university education, students-future teachers should master a set of pedagogical technologies that should be in the everyday didactic arsenal of every modern mathematics teacher: cloud technologies; technologies of distance learning and organization of the educational process; project (project method), which are best integrated with information and communication technologies; work in small groups (problem groups); consultations; game (simulation) technologies. Their implementation in the educational space of a higher education institution provides the necessary competencies of a future teacher and allows to increase the effectiveness of training, diversify organizational forms, methods of training, education, independent work of students, ensure a high scientific level of teaching academic disciplines in the higher education system.

The information and educational environment of distance learning is a systematically organized set of traditional and computer-oriented means of dialogue, data transfer, interaction protocols, multimedia systems, information and communication technologies, information resources, system hardware, software and organizational and methodological support, focused on meeting the needs of users (Fitsula, 2006).

The purpose of individual educational and research tasks (projects) is independent study of part of the program material, systematization, deepening, generalization, consolidation and practical application of the student's knowledge from the course and development of independent work skills.

Work in small groups consists of students carrying out activities with the aim of independently solving a certain scientific or educational problem, solving a specific task, usually of increased complexity. Among the positive features of collective cooperation, we note the development of creative thinking, the formation of communicative competencies, teamwork skills, increasing their own scientific activity, and promoting student self-expression in their work.

Consultations involve providing students with the necessary assistance in mastering theoretical knowledge, developing practical skills and abilities through the teacher's response to specific questions and/or explanation of individual theoretical provisions or aspects of their practical application. In terms of orientation, it should be aimed at helping students master the methodology of the topic or section, as well as methods of independent educational work (Kuz'mins'kyy & et., 2009).

Game methods are effective and are characterized by the activation of student thinking and behavior, a high degree of involvement in the educational process, the mandatory interaction of students with each other and the teacher, the emotionality and creative nature of the event, students' independence in decision-making, their desire to acquire skills and abilities in a relatively short period of time (Khyt', 2018), giving them an innovative character with the help of a multimedia board, a projector, the use of a computer with appropriate software, etc. Systematic use of these pedagogical innovations will contribute, according to O. Soya (2006), to the formation of a work culture of future mathematics teachers.

The transition from the use of traditional technologies to innovative ones in the educational process of a higher education institution is possible if there are necessary

conditions for conducting modern scientific research; providing the educational process with modern equipment, providing access to electronic resources; organizing the educational process with an orientation towards meeting the needs of students in quality education. Pedagogical innovations related to the improvement of education on the basis of new (or updated) ideas involve the definition and technological processing of innovations, as well as their experimental testing and verification. Accordingly, innovative technologies as a means of forming the culture of future mathematics teachers are a set of methods, forms and means of organizing work based on the use of modern technologies in education for the purpose of targeted influence on the student's personality, which provides for his activity, independence and mobility in learning and lays the foundation for readiness for further professional activity (Soya, 2006).

A convincing example of the feasibility of introducing innovative technologies into the educational process of a higher education institution for the preparation of an innovatively oriented modern mathematics teacher are the educational and professional programs of the bachelor's and master's levels of higher education in the specialty «Secondary Education (Mathematics)» (2024) at the Yuriy Fedkovych Chernivtsi National University.

The purpose of the programs is to train qualified teachers of mathematics and computer science for basic secondary education, who possess general and professional competencies in mathematics, computer science and modern teaching methods, digital technologies and pedagogy, aimed at obtaining teaching and innovative skills in the system of basic secondary education for effective pedagogical and practical activities. Educational programs have an applied orientation, are based on a harmonious combination of traditional and innovative methods and teaching; are aimed at the formation of theoretical knowledge and practical training of higher education applicants to perform professional functions of teachers of mathematics and computer science to meet the needs of basic secondary education; ensure the formation of the ability to self-education and professional self-improvement throughout life. Each educational program provides the opportunity to build an individual educational trajectory through the choice of disciplines, practice bases, and research topics. The catalog of elective subjects is updated annually, which allows us to take into account trends in the development of science and digital technologies, as well as changes in the field of education. For the professional development of education seekers, webinars and master classes from the «Path to a Dream Profession» cycle are regularly held by practicing specialists and employers.

Below we will consider the academic disciplines taught by the Department of Algebra and Informatics at the Faculty of Mathematics and Informatics of Yuriy Fedkovych Chernivtsi National University. These disciplines provide training for future mathematics teachers to teach mathematics in educational institutions using modern innovative technologies and skills in their use in teaching and also focus on the teacher's ability to develop and use integrated tasks and innovative types of lessons when teaching mathematics in educational institutions.

Academic discipline «Integrated lessons, teaching features» (2024). The goal is to ensure thorough mastery of theoretical material at the theoretical, methodological

and practical levels, to instill skills in the development and use of integrated tasks and lessons when teaching mathematics in secondary and tertiary education, to promote the formation of a system of knowledge among future mathematics teachers regarding the development and use of integrated lessons in the process of teaching students in secondary and tertiary education.

As a result of studying this academic discipline, the student must acquire certain competencies, in particular innovative ones:

- the ability to learn and master modern knowledge throughout life;

- the ability to apply different approaches to solving problems in pedagogical activities, to use innovations in professional activities;

- the ability to form and develop key and subject competencies in students through the means of the educational subject and integrated learning, to form value attitudes in them, to develop critical thinking;

- the ability to select and use modern information and communication technologies in the educational process and in extracurricular work, to analyze and evaluate the feasibility and effectiveness of their application;

- demonstrate knowledge of fundamental mathematics and apply classical and modern methods of mathematics to achieve other outcomes of the educational program.

The purpose of the academic discipline «Methodology of Teaching Mathematics in Educational Institutions» (2024) is to ensure thorough mastery of theoretical material at the theoretical, methodological and practical levels, to promote the formation of a system of knowledge among future mathematicians and mathematics teachers regarding perfect knowledge of mathematics teaching methods, the essence of innovative technologies and skills in their use when teaching mathematics in educational institutions.

As a result of studying the academic discipline, the student must acquire certain competencies, in particular innovative ones:

- the ability to learn, master modern knowledge and apply it in practical situations, as well as improve professional level throughout life;

- the ability to generate new ideas, identify and solve problems, take initiative, be creative and enterprising;

- the ability to integrate theoretical and practical knowledge to solve professional tasks and form key competencies of education seekers, using traditional and innovative methods and technologies;

- the ability to implement integrated learning and apply various forms and methods of diagnosing the achievements of students based on a competency-based approach, and to analyze the results of their learning;

- the ability to demonstrate and apply fundamental knowledge of the subject area in professional activities, to select and use modern and effective methods and technologies for teaching mathematics and computer science;

- the ability to initiate and conduct scientific research in the field of theory and methodology of teaching mathematics and computer science; to formulate new hypotheses and scientific problems of the subject area, to choose effective methods for their solution, the ability to present the results of one's own research using modern digital technologies;

- the ability to effectively use existing and create new electronic educational resources, fill them with high-quality educational and methodological materials necessary for the productive organization of the educational process;

- possess the basic theories, principles and methods of planning, organizing and managing work and educational processes that are complex, unpredictable and require new strategic approaches;

- use digital technologies, online services and educational electronic resources in professional activities; demonstrate media and information literacy and digital competence;

- demonstrate knowledge of modern scientific achievements of mathematical science and trends in its development, the ability to use them when teaching subjects of the mathematical cycle;

- integrate acquired knowledge and solve complex problems in broad or multidisciplinary contexts, choose effective methods for solving these problems;

- possess systematized knowledge of the subject area, in particular mathematics, mathematics teaching methods, and methods of scientific mathematical research.

Studying the course «Technologies of Teaching Mathematics and Informatics in Educational Institutions» (2024) is aimed at ensuring a thorough mastery of theoretical material at the theoretical, methodological and practical levels, promoting the formation of a system of knowledge among future teachers of mathematics and computer science regarding the essence of innovative technologies and skills in their use in teaching mathematics and computer science in educational institutions.

As a result of studying the academic discipline, the student must acquire certain competencies, in particular innovative ones:

- the ability to learn, master modern knowledge and apply it in practical situations, as well as improve professional level throughout life;

- the ability to generate new ideas, identify and solve problems, take initiative, be creative and enterprising;

- create a safe educational environment, choose appropriate teaching methods and technologies, effectively apply pedagogical concepts, and ensure partnership interaction with participants in the educational process;

- the ability to integrate theoretical and practical knowledge to solve professional tasks and form key competencies of education seekers, using traditional and innovative methods and technologies;

- the ability to navigate the information space, search and critically evaluate information, select and use information technologies and educational online services, analyze and evaluate the feasibility and effectiveness of their application in professional activities;

- the ability to implement integrated learning and apply various forms and methods of diagnosing the achievements of students based on a competency-based approach, and to analyze the results of their learning; - the ability to demonstrate and apply fundamental knowledge of the subject area in professional activities, select and use modern and effective methods and technologies for teaching mathematics and computer science;

- the ability to initiate and conduct scientific research in the field of theory and methodology of teaching mathematics and computer science; to formulate new hypotheses and scientific problems of the subject area, to choose effective methods for their solution; the ability to present the results of one's own research using modern digital technologies;

- the ability to effectively use existing and create new electronic educational resources, fill them with high-quality educational and methodological materials necessary for the productive organization of the educational process;

- conduct scientific and research activities, solving problems in the subject area;

- apply innovative methods and research skills during project activities, demonstrate the results of their own research using modern digital technologies;

- use digital technologies, online services and educational electronic resources in professional activities, demonstrate media and information literacy and digital competence;

- organize various forms of learning (traditional, distance, blended) taking into account their specificities; apply appropriate methods of assessing the educational achievements of students, using various forms and means.

The purpose of the academic discipline «Information and Communication, Cloud Technologies in Education» (2024) is to familiarize students with the basic concepts of cloud services, methods and principles of their structure and a general overview of their main types, to master a system of knowledge on the methodology of cloud services functioning, and to acquire the abilities (competences) to effectively implement theoretical knowledge in everyday life and professional activities.

The main objectives of studying the discipline are:

- familiarizing future specialists with the characteristics and functionalities of cloud services;

- equipping students with theoretical knowledge of the use of cloud technologies in various fields of activity and the principles of cloud computing;

- familiarization with the main areas of use of cloud technologies in various professions;

- mastering a conscious and responsible attitude to the theoretical and practical foundations of using cloud technologies and applying them in practice.

As a result of studying the academic discipline, the student must acquire certain competencies, in particular innovative ones:

- the ability to learn, master modern knowledge and apply it in practical situations, as well as improve professional level throughout life;

- the ability to navigate the information space, search and critically evaluate information, select and use information technologies and educational online services, analyze and evaluate the feasibility and effectiveness of their application in professional activities; - the ability to demonstrate and apply fundamental knowledge of the subject area in professional activities, select and use modern and effective methods and technologies for teaching mathematics and computer science;

- the ability to effectively use existing and create new electronic educational resources, to fill them with high-quality educational and methodological materials necessary for the productive organization of the educational process.

Having analyzed the syllabi of the above disciplines, we can conclude that the introduction of innovative technologies into the educational process of a pedagogical higher education institution is associated with the emergence of fundamentally new approaches to education, the redistribution of procedural roles and the change of priority tasks, which qualitatively changes the capabilities of both the student and the teacher in choosing an educational trajectory and significantly increases the autonomy and mobility of students.

**Discussion.** The competencies developed through the academic disciplines "Integrated Lessons", "Teaching Features", "Methodology of Teaching Mathematics in Educational Institutions", "Technologies of Teaching Mathematics and Informatics in Educational Institutions", and "Information and Communication, Cloud Technologies in Education" demonstrate a commitment to cultivating innovative, adaptable, and technologically proficient educators. This analysis compares and evaluates these competencies to identify commonalities, distinctions, and their alignment with the goals of modern education.

The main common competencies across disciplines are:

1. *Lifelong learning and continuous improvement*. All the disciplines emphasize the ability to learn, master modern knowledge, and improve professional levels throughout life. This reflects the necessity for teachers to remain adaptable and up-to-date in an evolving educational landscape.

2. Application of fundamental knowledge. Each discipline highlights the importance of demonstrating and applying foundational knowledge of mathematics and related fields. This competency ensures educators are equipped with strong subject expertise.

3. *Integration of theory and practice*. A shared focus on integrating theoretical and practical knowledge to address professional tasks signifies the importance of preparing educators for real-world challenges.

4. *Digital competence and use of ICT*. All programs stress the ability to select and effectively utilize modern information and communication technologies (ICT) in both teaching and professional activities. This competency aligns with the increasing digitization of education.

5. *Creation and utilization of educational resources*. The development and effective use of high-quality electronic educational resources are emphasized across all disciplines, underscoring the role of digital tools in enhancing the educational process.

The main Distinctive Competencies across disciplines are:

1. *Integrated lessons, teaching features*. Focus on integrated learning to develop key and subject competencies, critical thinking, and value attitudes in students.

Emphasis on applying integrated tasks and methods in secondary and tertiary education.

2. *Methodology of teaching mathematics in educational institutions*. Highlights the ability to implement competency-based assessments and innovative diagnostic tools. Prepares educators for scientific research in teaching methodologies, enabling them to formulate hypotheses and solve complex problems.

3. Technologies of teaching mathematics and informatics in educational institutions. Includes competencies in creating a safe and interactive educational environment, applying pedagogical concepts, and fostering collaborative relationships in education. Develops skills for blended learning and appropriate methods of assessing student achievements.

4. Information and communication, cloud technologies in education. Focuses specifically on the principles and functionalities of cloud services, preparing educators to integrate these tools into their professional activities. Equips students with a responsible attitude toward the use of cloud technologies and their applications across professions.

Table 1 summarizes competencies by academic discipline.

Competency Area	Integrated Lessons, Teaching Features	Methodology of Teaching Mathematics in Educational Institutions	Technologies of Teaching Mathematics and Informatics	Information and Communication, Cloud Technologies in Education
Lifelong Learning and Continuous Improvement	Ability to learn and master modern knowledge throughout life	Ability to learn, master modern knowledge, and improve professional level throughout life	Ability to learn, master modern knowledge, and improve professional level throughout life	Ability to learn, master modern knowledge, and improve professional level throughout life
Integration of Theory and Practice	Use integrated tasks and lessons to connect theory and practice in teaching mathematics	Integrate theoretical and practical knowledge to solve professional tasks and develop key competencies	Integrate theoretical and practical knowledge to solve professional tasks and foster competency-based learning	Integrate theoretical knowledge of cloud technologies into practical applications
Application of Fundamental Knowledge	Demonstrate and apply fundamental knowledge of mathematics and teaching methods	Apply classical and modern mathematical methods in teaching and professional activities	Demonstrate and apply knowledge of mathematics and informatics in professional tasks	Apply theoretical knowledge of cloud computing and ICT tools in educational and professional settings
Innovative Problem Solving	Develop and implement innovative approaches to integrated learning	Generate new ideas, solve problems creatively, and take initiative	Take initiative and create innovative solutions in designing safe and effective educational environments	Apply innovative strategies using cloud technologies and ICT in teaching and research

Table 1. Summary of competencies by academic discipline

Competency Area	Integrated Lessons, Teaching Features	Methodology of Teaching Mathematics in Educational Institutions	Technologies of Teaching Mathematics and Informatics	Information and Communication, Cloud Technologies in Education
Use of ICT and Digital Competence	Select and use ICT tools for integrated lessons and analyze their feasibility	Apply modern digital technologies for teaching, conduct research, and assess learning outcomes	Navigate the digital space, evaluate and implement ICT tools, and foster media and digital literacy	Use and evaluate cloud services and educational technologies for professional tasks
Educational Resource Creation and Utilization	Create and use integrated tasks and electronic educational resources for productive teaching	Design and use high- quality electronic resources for effective teaching and professional development	Develop and apply electronic educational resources for blended learning, distance learning, and traditional education	Create and apply high-quality cloud- based resources for organizing the educational process
Competency-Based Learning	Form subject- specific and key competencies in students through integrated tasks	Implement competency-based assessments and diagnostic tools to evaluate student learning	Develop and apply competency-based forms and methods for assessing student achievements	Foster competency- based learning using cloud technologies
Research and Innovation in Education	Not explicitly addressed	Conduct research on teaching methodologies, generate hypotheses, and solve problems in the field	Conduct research, apply findings to enhance teaching practices, and contribute to the academic field	Conduct research on cloud technology applications and present findings using modern digital tools
Safe and Collaborative Learning Environment	Not explicitly addressed	Not explicitly addressed	Create a safe, interactive, and collaborative learning environment for students	Not explicitly addressed

Sources: developed by author

This table provides a clear comparison of the competencies emphasized across the disciplines, showcasing overlaps and unique focus areas.

The competencies developed across these academic disciplines collectively prepare educators to meet the demands of modern education by fostering lifelong learning, critical thinking, digital proficiency, and the integration of innovative teaching methods. While each program offers unique competencies tailored to its specific focus, their shared emphasis on adaptability, technological integration, and pedagogical innovation ensures a cohesive and comprehensive approach to training future mathematics teachers. This alignment not only equips educators for immediate professional tasks but also empowers them to contribute to the broader advancement of educational practices. **Conclusion.** Summing up the above, we note that in the conditions of rapid changes in society, an effective way to train a modern mathematics teacher is to introduce innovative technologies into student teaching. Their use in the process of training future mathematics teachers provides certain opportunities: it expands the boundaries of individual and distance learning, helps in organizing planning and monitoring of students' independent work, and ensures positive dynamics in the level of assimilation and systematization of educational material.

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