DIGITAL INNOVATIONS IN THE EDUCATION BACHELORS PROFESSIONAL TRAINING AS A NEW UKRAINIAN SCHOOLS REQUIREMENT

Shyshenko Inna
Candidate of Pedagogical Sciences, Associate Professor, Associate Professor of Departments of Mathematics, Physics and Methods of Teaching
Makarenko Sumy State Pedagogical University, Ukraine

Martynenko Olena
Candidate of Physical and Mathematical Sciences, Associate Professor, Associate Professor of Departments of Mathematics, Physics and Methods of Teaching
Makarenko Sumy State Pedagogical University, Ukraine

Chkana Yaroslav
Candidate of Pedagogical Sciences, Associate Professor, Associate Professor of Departments of Mathematics, Physics and Methods of Teaching
Makarenko Sumy State Pedagogical University, Ukraine

Summary. The article highlights that digital innovations in the training of future teachers is a characteristic of such an organization of educational activities, when consciously, purposefully and effectively uses digital equipment, modern software, technical and information equipment that provides active use of information and communication and multimedia technologies in the educational process; when future teachers are radically different in their willingness to work at school in the new digital educational environment.

Keywords: future bachelors of education; professional training; digital innovations; new educational environment; New Ukrainian School.

1. Introduction
Adaptation of the educational process to the challenges of the future implies the need to provide all areas of the digital economy with human resources that have a system of developed skills, abilities and competencies in the field of information and digital technologies. It is obvious that the growth of digitalization and technology will require a large number of IT professionals in the near future, and over time, mastering the skills of digital technology will become a necessary, basic skill of every young specialist. State policy in the field of education development aims at
educational organizations on a systematic approach to ensuring quality training of students as literate users of information devices and technologies capable of making a rapid leap of our country into the "digital" future.

The Ministry of Education and Science of Ukraine has developed the concept of «New Ukrainian School», which contains the principles of reforming secondary education in accordance with the leading trends in modern information society. Educational institutions are faced with the task of forming and developing young people's skills to learn throughout life, search for creative ideas and new knowledge, apply acquired knowledge in finding optimal and effective ways to solve life and professional problems, use information and digital technologies, work together as a team, communicate in a multicultural environment etc.

Trends in informatization and digitalization of all spheres of activity, including in the field of mathematics education, determine the emphasis in the training of future teachers of mathematics. Accordingly, the field of their professional training should respond quickly to the orders of society in the form of the Concept of the New Ukrainian School.

In the context of the implementation of this concept, the professional training of future mathematics teachers requires a number of changes, among which the leading place is occupied by digital innovations and the integration of information and educational environment of free economic science with specialized software. All this highlights the need to improve the process of professional training of mathematics teachers.

Therefore, the problem of effective training of teachers of physical and mathematical specialties in the formation of their digital competence and new digital pedagogical thinking for the development of creative personality and achieving better results in solving standard and non-standard situations of educational and professional activities.

In addition, digital innovations in the training of future mathematics teachers should be aimed at helping students understand the importance of mathematical knowledge, skills, abilities, methods and the formation of their ability to realize their creative potential.

The purpose of the article is to highlight the basic theoretical principles of the Concept «New Ukrainian School», to justify the feasibility of digitizing the training of future mathematics teachers to implement this concept and describe the features of its implementation in the educational process.

2. The results of the study

The word «digitalization» is firmly entrenched in the practice of educational institutions. However, its essence cannot be reduced or limited by providing wide access to high-speed Internet, translating existing textbooks into digital format or creating their digital counterparts, digitizing existing documents, textbooks and teaching aids, etc. First of all, it is necessary to change the approach to the organization of educational activities of all subjects of educational relations, to the modeling of content and pedagogical technologies, ie why and how to teach [5].

The active development of educational technologies, the expansion of the socio-cultural environment and the complication of the information space inevitably
change our perception of human functional literacy. Today we talk about the importance of digital literacy of mathematics teachers, defining it as a set of knowledge and skills that ensure safe and efficient use of digital and information technologies, Internet resources in the search, processing (systematization, generalization) and transmission of information and in various activities [2].

We consider digital literacy as a holistic set of personal, technological and intellectual-digital skills necessary for a person to successfully adapt to life in the modern information society. By digital skills we mean virtually automated behaviors based on knowledge and skills, abilities and readiness to use digital devices, communication applications and information networks to address a variety of learning and life situations, self-realization in learning, professional, social and social activities in general. We emphasize that digital competencies are not the goal of education, they should be considered as a means of solving new pressing problems.

The development of digital literacy of future mathematics teachers involves:
1) formation of skills to interact with digital technology;
2) understanding the peculiarities of working with digital information (search, dissemination) and mastery of the culture of its consumption;
3) mastering the culture of online networking and the use of media resources;
4) formation of skills in the use of digital technologies in professional activities, as well as for self-development and self-education.

Possession of digital technologies will allow the teacher to individualize the process of modeling the educational trajectory of each student and his educational activities at different stages of learning (from learning new material to monitoring individual results). This will allow to some extent to overcome the limitations of the classroom system with a single curriculum for all students in the class, a set of curricula and teaching kits [4].

Informatization of education includes the creation of an open information space and information-rich educational environment, active development and application in educational practice of digital technologies, new forms and methods of teaching and more. It is a complex and long process that has both advantages and disadvantages, but is always aimed at improving the quality and effectiveness of education at all levels.

The process of digitalization / informatization of higher pedagogical education is aimed at [1]:
- creating favorable conditions for access to educational and scientific information;
- modernization of content, improvement of technologies and forms of education focused on the implementation of pedagogical goals through the use of the latest technical advances and IT;
- intensification of interaction of participants of educational relations by means of informatization;
- improving the efficiency and quality of educational activities and results (achievements);
- individualization of education and motivation, which will inevitably lead to increased learning efficiency;
- creation of new forms of interaction "student-digital device" in the learning process;
- mastering strategies for solving educational and practical problems with the help of IT.

Digital innovations in the professional training of future teachers is a characteristic of such an organization of educational activities, when consciously, purposefully and effectively used digital equipment, modern software, technical and information equipment that provides active use of information and communication and multimedia technologies in the educational process; when future teachers are radically different in their willingness to work at school in the new digital educational environment [3].

Digital and information technologies should be considered as a tool for independent search and obtaining the necessary information, the creation of modern educational materials, as a method of teaching and a mechanism for modeling technological and developmental educational environment.

In order to study the state of use of digital innovations in the professional activity of mathematics teachers, a survey was conducted among mathematics teachers in Sumy and Sumy region (46 respondents). The results of the survey showed that the majority of respondents (74%) have uncertainty about their own information and digital competence in the context of digitalization of secondary education. Some respondents (42%) noted a lack of awareness of the use of digital technologies in professional activities. 82% of surveyed mathematics teachers said they would like to increase the level of digital readiness to use IT technologies in their professional activities. The data of the survey of teachers of physics and mathematics faculties of pedagogical free economic zones revealed that teachers have digital technologies at a high level, use multimedia tools, didactic developments to support students' learning activities, as well as to increase their own level of information and digital competence.

Thus, in our opinion, the introduction of digital innovations in the process of professional training of future mathematics teachers to work in the New Ukrainian School should be carried out through the use of information and educational environment ZVO; Internet resources; communication programs (Viber, Messenger, Telegram, etc.); learning management systems (Moodle); open educational resources; illustrative and informational means.

Thus, in Makarenko Sumy State Pedagogical University e-courses of professional disciplines of the educational program for future teachers of mathematics are presented on the platform of distance learning Moodle. Students can access them through the university website after registering. The course contains texts of lectures and tasks for practical classes with presentations, various methodological materials, links to the necessary sources of information. In the Moodle system, students can provide results of tasks, take tests, monitor the level of their academic achievements. Lectures and practical classes are held mainly in the form of video conferencing using the capabilities of Zoom or Google Meet (Fig. 1).
It is advisable to use the MS Excel application program or the SPSS statistical package during lectures on mathematical disciplines. Given the significant reduction in classroom hours, there is a need for effective use of lecture time, so we consider it appropriate when compiling working programs of mathematical disciplines to divide the teaching material into two parts: one that will be taught directly at lectures and one that can be developed by students in advance or after the lecture. We also consider it appropriate to create a system of video lectures to support the training course.

3. Conclusions

We need to restructure the structure and format of professional training of future mathematics teachers so that they correspond to modern realities. Digital technology opens up a wide range of opportunities for teachers to experiment and seek new approaches, change their pedagogical style, enjoy what is happening in the educational process, and make their lessons modern, effective and exciting.

Let's mark the main directions of digitalization of the sphere of professional education of future mathematics teachers:

1) computerization of educational organizations, providing them with digital equipment (computers, multimedia projectors and boards, printers, scanners, modems, etc.);
2) wide access to the Internet (classroom and remotely);
3) active use of distance learning technologies in the implementation of various educational programs. This has become extremely relevant in the context of pandemics, quarantine and self-isolation. But the use of such technologies requires further development of a system for monitoring educational outcomes, the variability of which is currently being systematically tested;
4) the creation of a single information system for monitoring the conditions, organization of the process and learning outcomes will implement a single conceptual basis for identifying objective indicators of educational quality, identify shortcomings, achievements and advantages of a particular method of learning;
5) replenishment of library funds and repositories of educational organizations with electronic textbooks and interactive multimedia textbooks that meet modern requirements of state educational standards, improve the quality and efficiency of education, allow to convey to the pedagogical community the development of innovative teachers;
6) creation of information and methodological centers to increase the level of computer literacy of teachers, acquaintance of all subjects of educational relations with the latest digital technologies and methods of their use in educational practice;

7) providing (updating and timely adjustment) of the regulatory framework for the introduction of digital devices and information technology in the educational process.

References:


