LEADERSHIP AND INNOVATION UNIVERSITY

DECEMBER 12-13, 2022, INNSBRUCK, AUSTRIA

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MODERN TRENDS IN THE DEVELOPMENT OF SCIENCE AND TECHNOLOGY

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Titova L.O.

THE CURRENT STATE OF FORMATION OF INFORMATION AND DIGITAL COMPETENCE OF FUTURE MATHEMATICS TEACHERS

Abstract. Increasingly, we can observe that traditional means of learning are becoming less effective compared to innovative ones. Pedagogical activity requires an increasingly creative approach and the use of tools that will increase cognitive interest and interest learners in educational activities, a special place among which is occupied by information and communication technologies, which is caused by total digitalization.

Due to quarantine requirements and the full-scale invasion of the Russian Federation on the territory of Ukraine, the widespread use of distance learning has become a decisive factor in the active creation and use of e-environments by educational institutions, which in turn requires sufficiently developed information and digital competence from teachers.

Therefore, a modern teacher who keeps up with the times needs to have competencies in searching and processing information, working with computer equipment, as well as the ability to use them in professional activities and to solve personal problems.

Keywords: Information and digital competence, future mathematics teachers, information and communication technologies, Geogebra.

In the conditions of informatization of society, traditional methods and forms of education are being replaced by innovative ones, and priority is given to those innovations based on the use of information and communication technologies in the process of training students. Along with this, ICT tools, in particular services to support distance learning and videotelephony (Classroom, Moodle, Zoom, Google Meet,

Webex Meet, etc.), have become an integral part of the teacher's activity, since the Covid-19 pandemic and the full-scale military invasion of Russia on the territory of Ukraine make full-time education impossible. These factors make it necessary to form the information and digital competence of future teachers, in particular mathematics, in the process of their professional training in institutions of higher education.

According to such regulatory documents of Ukraine as the concept of «New Ukrainian School» (2016) and the Professional Standard for the profession of «Teacher of a General Secondary Education Institution» (2020), information and digital competence is indicated as one of the keys for applicants and teachers, respectively [1, 2].

Speaking about the Teacher's Professional Standard, we note that information and digital competence is defined as the ability to navigate freely in the information space, the ability to search and process information, as well as the ability to objectively evaluate and use it in pedagogical activities; the ability to use educational electronic resources or create your own; the ability to introduce digital technologies into the educational process (not only educational, but also to ensure organizational and methodical work, in particular keeping electronic journals, electronic assessment forms, e-portfolio) [2].

Modern scientists point out the importance and even the necessity of the formation of information and digital competence in students of pedagogical specialties, while investigating the impact on the formation process of a wide variety of tools, techniques, methods, and technologies as a whole. However, taking into account the worldwide globalization and informatization, all opinions agree that this competence is one of the key ones in the training of a modern teacher.

Researchers, considering the problem of formation of information and digital competence among future specialists in the field of education, offer various ways to solve it, in particular, the creation and constant use of the e-environment of the educational institution, the study of the disciplines of the IT cycle, the use of information and communication technologies in the study of the disciplines of general

and professional training, use of STEM technology, gamification technology and other innovative technologies [3].

All the described methods in a complex make it possible to form stable information and digital competence of the future teacher, because a modern teacher must have the skills to work on distance learning platforms to provide students with access to educational materials, especially in the difficult conditions of the energy crisis in Ukraine, to be able to work with videotelephony tools, e.g. Zoom, Google Meet, to provide interaction with students, etc. In addition, a teacher who keeps up with the times must have tools for creating educational content - office programs, software or cloud tools for creating presentations (Canva, Google Presentations, Prezi, PowToon, Emaze, MS PowerPoint), tests and quizzes ("Kahoot!", Quizizz, Quizlet, Plickers), mind maps (XMind, Draw.io, Miro.com), interactive exercises (LearningApps, Wordwall).

However, there are a significant number of services designed exclusively for learning mathematics, such as Geogebra, which is an excellent visual aid for studying stereometry and graphing functions, Desmos Graphing Calculator, which will help with graphing the most complex functions, and others. Therefore, in our opinion, it is worthwhile to familiarize students with higher education - future teachers with such tools during the study of professional disciplines. It will be appropriate to familiarize students with these software tools within the scope of studying the discipline «Methodology of teaching mathematics» or to use these tools directly when studying such disciplines as «Informatics», «ICT in the field», «Computer modeling», «Elementary mathematics», «Mathematical analysis», «Analytic geometry», etc. This will make it possible to explore such tools and develop skills for working with them for their further use in professional activities.

Let's consider the possibilities of using the Geogebra dynamic mathematics package on the example of the study of the discipline «ICT in the industry» by students of the Pavlo Tychyna Uman State Pedagogical University, major 014 Secondary Education (Mathematics). Thus, during the study of the course of this discipline, it is advisable to familiarize future teachers with software tools, cloud and mobile

technologies that will be useful directly in their further professional activities, including Geogebra. One of the features of this tool is the visualization of finding solutions to a system of equations with two variables, because these solutions are the coordinates of the intersection points of the graphs of the function, which are formed as a result of performing equivalent transformations of the given equations (Fig. 1). Using this resource will significantly save the teacher's time and effort spent on constructions on a physical or virtual board.

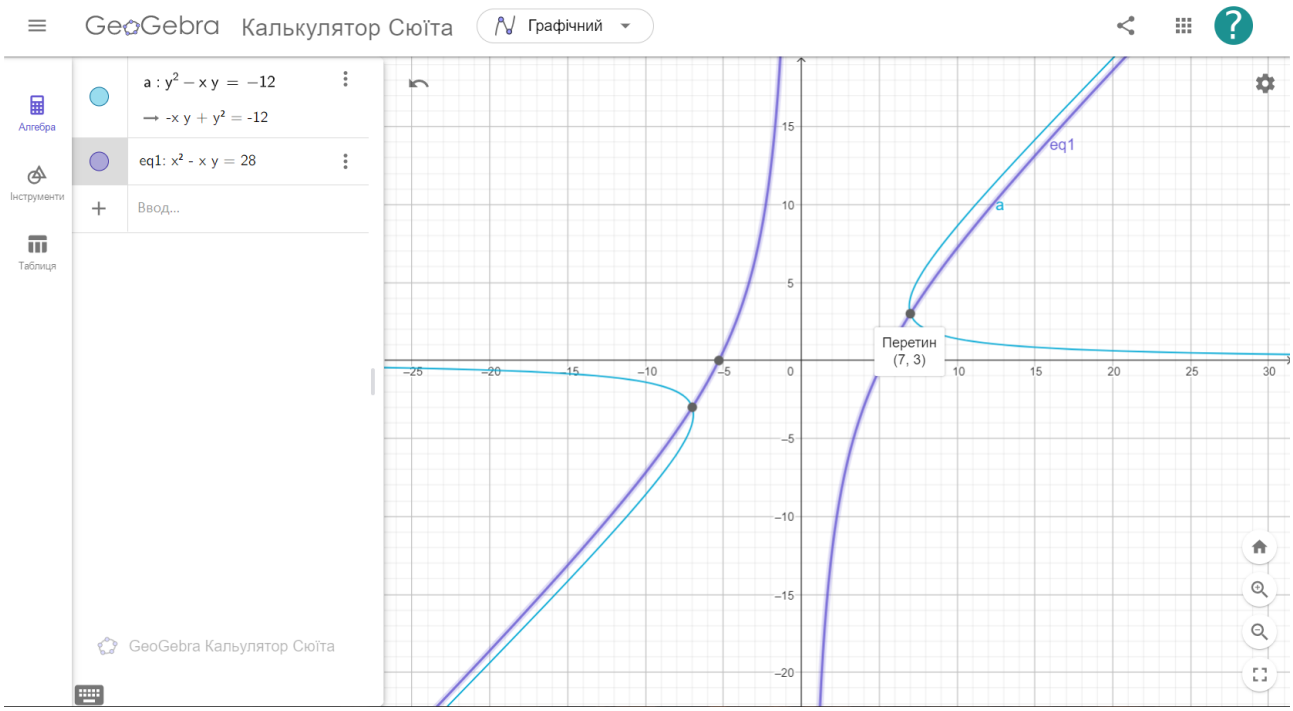

Fig. 1 – An example of a graphical solution of a system of equations with two variables

Also, in our opinion, the use of such services will contribute not only to the formation of the professional competence of the future teacher of mathematics, but also to the development of his information and digital competence due to the progress of practical skills of interaction with information and communication technologies within the educational process.

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