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THE ROLE OF PEDAGOGICAL TECHNOLOGIES IN THE TEACHING OF HIGHER MATHEMATICS

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ABSTRACT

In this work, the mathematical competence of a future technical specialist is understood as the ability to use their mathematical knowledge in solving practical and theoretical problems that arise in their professional activities, expressing both fundamental mathematical knowledge and unified personal knowledge based on practical skills.

Keywords: Competence, Knowledge, Skill, Tasks, Competence Approach, Future Specialist.

INTRODUTION

The structure and content of the mathematical competence of future technical specialists include the following components: axiological (knowledge about mathematical facts, concepts, laws, theories; knowledge about the structure of mathematical activity), epistemological; knowledge about the methods of mathematical knowledge), praxeological (Hoppe, 1993), the ability to self-education, the use of knowledge gained in professional activity, the ability to use the knowledge gained in practice). All of them reflect the requirements for the quality of mathematical training in vocational education. Preparation, as a complex psychological structure, in addition to the necessary knowledge, skills and abilities, includes not only adequate requirements for professional activities, qualities and abilities of the individual, but also cognitive (understanding professional tasks, assessing their importance, etc., motivational (interest in the profession, striving for success, etc.) and volitional (overcoming doubts, the ability to work on oneself) also include components. The ability of a competent specialist to go beyond the scope of his profession allows defining competence as a higher degree of readiness (Bekboev, 2003).

Rationale in carrying of this study is based on explanation of competence types, mathematical competence formation in higher education, stages and conditions in mathematical competence formation, pedagogical conditions necessary in teaching mathematics, teaching content role, mathematical competence formation in lectures and practical classes and the role of technologies.

When preparing mathematics teachers at a pedagogical university, vocational guidance in mathematics is necessary, this was very well studied by O. B. Episheva, A. G. Mordkovich and others (Episheva, 1999). The problem of vocational guidance in mathematics has been studied to some extent in economic universities. Various aspects of vocational education in mathematics have also been studied for many technical specialties. Following the provisions of the state

standard of higher professional education of the third generation in the Kyrgyz Republic, the main didactic conditions for teaching mathematics include contextual learning, mathematics interdisciplinary integration course both with the natural and mathematical cycle disciplines and with the subject-information approach to teaching mathematics and other fundamental his subjects of the cycle. An analysis of the ways to achieve the quality of mathematical training, in particular the ways of forming mathematical competencies, taking into account the evolution of the standards of the second and third generations, showed an essential characteristic of these ways.

The evolution of standards makes it possible to prognoses the transition to the use of integrative, integrated approaches aimed at the formation of mathematical competencies in the future, with an increase in the number of basic approaches to teaching mathematics (competency-based, contextual, interdisciplinary, subject-informational). The mathematical competence formation in students depends on a unity of knowledge and experience of application; thus, it becomes necessary in organizing various practices using mathematical knowledge.

Mathematical competence formation in university students is a pedagogical process that takes place in several stages. According to the formation logic in the "Mathematics" academic discipline, the formation of mathematical competence in university students will form in the following stages:

1) Motivational target;
2) Content-activity;
3) Productive evaluative.

According to the new educational paradigm, every novice specialist, regardless of the specialty and nature of work, must have fundamental knowledge, professional skills and experience in his profile, experience in students creative and research activities to solve new problems, experience in social and evaluative activities.

In a sense, all pedagogical technologies are informational, since the educational process always accompanied by the exchange of information between the teacher and a student. However, education information technologies in the modern sense are pedagogical technologies that use special methods, software and hardware (cinema, audio and video equipment, computers and telecommunication networks) to work with information.

Consequently, information technologies in teaching (Radović et al., 2019) should be understood as applications of information technologies for creating new opportunities for the transfer of knowledge (teacher's activities), knowledge acceptance (student's activities), assessing the quality of teaching and, of course, the comprehensive development of the individual in the educational process at the university (Trujillo-Torres et al., 2020). Computer training allows students to solve a wide range of didactic problems through special computer training programs, expands the training database (electronic libraries, domestic and foreign databases, the Internet), allows you to choose an individual learning pace (adapted computer programs). The practice of using mathematical methods for solving problems is increasingly based on the functionality of software mathematical packages, the most famous of which are Derive, MathCad, Maple, MatLab, Matematica (Ochkov & Bogomolova, 2015).

Anastassiou & Iatan, 2013). The use of multifunctional software and mathematical support will not only strengthen the implementation of applied direction in mathematical education, but also introduce new opportunities in the professional training of future specialists. From the specialists' point of view of the mathematical competence in solving mathematical problems, it is important to understand the unique capabilities of various tools for implementing various methods in solving and various forms of obtaining results: exact and approximate methods, symbolic (analytical), numerical, graphic results. As it is known, personality is formed and develops primarily in an active form during joint and individual activity.

Essentially, traditional teaching is based on the teaching concept. Lectures at higher educational institutions are the main link in the education didactic cycle. Its purpose is to form an approximate basis for the further assimilation of educational material by students. Currently, the educational materials lecture presentation has both supporters and opponents. However, the practice has shown that refusal to lecture reduces the scientific level of students' training, violates the systematic and uniformity of their work during the semester. Therefore, lectures continue to be the leading form of educational process organization in higher educational institutions. In the process of education at the Higher School, practical classes implemented. They were designed for in-depth study of the discipline, play an important role in the development of students' skills to use the knowledge gained to solve practical problems. Practical classes are designed to help deepen, expand the knowledge gained at lectures and develop skills for professional activity. Practical classes develop scientific thinking and speech, allow students to test their knowledge, and act as a means of operational feedback.

Mathematics is widely used in the study of other subjects in school, it is used in the practical work of future workers, engineers, technologists, economists, and in everyday life. Knowledge of the basics of mathematical science is necessary for all students.

How can one instill an interest in mathematics? How to motivate students to study the subject and stimulate their activity throughout the lesson? Through independence and activity, through the search activity in the classroom and at home, the creation of a problem situation, the diversity of teaching methods, through the novelty of the material, through the use in the learning process of active methods and forms of work in the lesson.

Active methods of teaching are methods that encourage students to actively think and practice in the process of mastering the teaching material. Active learning involves the use of a system of methods that focuses primarily not on the teacher's presentation of finished knowledge, their memorization and reproduction, but on the independent mastery of students' knowledge and skills in the process of active mental and practical activity. Using active methods in math lessons helps to form not just knowledge-reproductions, but skills and needs to apply this knowledge for analysis, assessment of the situation and making the right decision

Methods of active teaching can be used at various stages of the learning process:

1. Stage 1 - the primary mastery of knowledge. This could be a problem lecture, a heuristic conversation, an academic discussion, etc.
2. Stage 2 - knowledge control (fixing). Methods such as collective thought activity, testing, etc. can be used.
3. Stage 3 - formation of skills and skills based on knowledge and development of creative abilities; It is possible to use simulated training, game and non-game methods.

Active forms of teaching in the teaching of mathematics

Didactic games are a type of training sessions organized in the form of educational games that implement a number of principles of game, active learning and differ in the existence of rules, a fixed structure of gaming activity and the evaluation system, one of the methods of active learning.

It is most advisable to use didactic games and game situations when checking the results of training, developing skills, forming skills.

In geometry lessons, you can suggest the «Theorem - puzzle» method. Students are invited to collect a theorem from 4 fragments. One contains the formulation of theorems, the other contains a blueprint for the theorem, the third contains what is given and what needs to be proved, on the fourth, the proof. All the theorems of the course are collected in one package. Methods of obtaining feedback. «Unfinished sentences». Participants are invited to complete the following proposals: The most important question that was raised today ... The most difficult for me in today's class was ... Today I understood (...) that ...

Problem learning is training, in which the teacher, systematically creating problem situations and organizing the activities of students to solve problems, provides an optimal combination of their independent, search activity with the assimilation of ready-made conclusions of science. Problem training is aimed at the formation of cognitive independence of students, the development of their logical, rational and critical thinking, and also involves not only the assimilation of the results of scientific knowledge, but also the very path of cognition, ways of creative activity. At the heart of the organization of problem learning is the personality activity principle. Discovery by students under the guidance of a teacher, conclusions of science, ways of acting, the invention of new subjects or ways of applying knowledge to practice. The content of the problem situation is a learning problem that creates the need for solving an intellectual problem, the desire to think and operates with such concepts as a problem, a problem question, a problem task, problematic as a learning principle.

Ability to engage students in their work, teach them to learn, and there is pedagogical skill, to which all teachers always strive for it. And I want to finish my article with the words of I.G. Pestalozzi: «My students will not recognize the new from me; they will discover this new themselves. My main task is to help them open up, develop their own ideas».

REFERENCES

1. Zarukina, E.V., Logvinova, N.A., Novik, M.M. (2010). Aktivnye metody obucheniia: rekomendatsii po razrabotke i primeneniiu [Active methods of teaching: recommendations for the development and application]. Saint Petersburg: SPbGIEU [in Russian].
2. Kurianov, M.A., & Polovtsev, V.S. (2011). Aktivnye metody obucheniia [Active learning methods]. Tambov: FGBOU VPO «THTU» [in Russian].
3. Lapyhin, Iu.N. (2017). Metody aktivnoho obucheniia [Methods of active learning]. Moscow: Yurait [in Russian].
4. Bulanova-Toporkova, M.V., & Kukushina, V.S. (2002). Pedahohicheskie tekhnolohii [Pedagogical technologies]. Rostov- na-Donu: Mart [in Russian].
5. Anastassiou, G. A., & Iatan, I. F. (2013). Intelligent Routines: Solving Mathematical

6. Analysis with Matlab, Mathcad, Mathematica and Maple (582 p). Springer. https://doi.org/10.1007/978-3-642-28475-5
7. Arnold, J. C., Boone, W. J., Kremer, K., & Mayer, J. (2018). Assessment of Competencies
8. in Scientific Inquiry through the Application of Rasch Measurement Techniques. Education Sciences, 8, 184. https://doi.org/10.3390/educsci8040184
9. Bekboev, I. B. (2003). Professional Competence Is the Basis of Quality Pedagogical Work
10. (pp. 65-71). Soros Foundation Kyrgyzstan.
11. Episheva, O. B. (1999). The Activity Approach as a Theoretical Basis for the Design of a Methodological System for Teaching Mathematics (460 p). Dissertation, Moscow: Tobolsk State Pedagogical Institute named after D.I. Mendeleev.
12. Garavan, T., & McGuire, D. (2001). Competencies & Workplace Learning: Some Reflections on the Rhetoric & the Reality. Journal of Workplace Learning, 13, 144-164.
13. https://doi.org/10.1108/13665620110391097.