System Of Problems Based On Competent Approach From Geometry In Academic Lyceums

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ABSTRACT

The article provides information on the importance of applying a competency based approach to solving problems in the field of geometry and competency issues.

Keywords: efficiency of education, competent approach, a common matter, competence issues

ANNOTATSIYA

Maqolada geometriya fanidan masalalarni yechishda kompetensiyaviy yondashuvni qo'llashning ahamiyati va kompetensiyaviy masalalar haqida ma'lumot beriladi.

Kalit so'zlar: ta'lim samaradorligi, kompetent yondashuv, odatdagi masala, kompetensiyaviy masalalar.

Today, mathematics education includes not only the goals related to the mastery of the content of the subject "mathematics", which means the application of mathematical knowledge in solving any mathematical problem, but also more and more general: specified skills. and requires the achievement of goals related to the acquisition of general competence to be able to apply mathematical knowledge in other academic subjects or in daily practice, in situations that may be encountered in life. The main purpose of these is concentrated in the concept of "learning-cognitive competence" of students,

which is related to the main type of activity of students - learning-learning activity.

Educational activity is an element of the holistic educational process, a purposeful, systematically organized, externally controlled or independent interaction of the student with the surrounding reality, the result of which is the student's system of knowledge about the world, acquisition of cognitive skills and competences (at the level of re-creation or creativity), as well as the formation of knowledge and emotional-valuable attitude to reality.

Taking into account what has been said, educational competence is understood as a complex phenomenon embodied as a set of knowledge, skills, and methods used to implement motivated, independent educational activities.

Learning competence is the student's personal qualities, which reflect the student's acquisition of learning competence (knowledge, skills and abilities, methods of using them to implement learning activities). we understand as a sum.

In the process of its acquisition, learning competence acquires "personal coloring" with the qualities of the student and three: cognitive (system of knowledge), active (skills) and value-motivational (motives and value orientations) is embodied in the form of educational competence, which includes the component.

We highlight the components of educational competence that can be developed in students, for example, when studying a stereometry course, these are: motivation to learn; the skills of organizing one's own educational activities; informational skills; logical skills; system of knowledge related to the field of science (stereometry). For a stereometry course, the logical component is of great importance, there is an opportunity to consider real-world models, and information from personal experience is used.

Mathematics takes one of the leading places in the formation of students' learning competence.

Firstly, doing mathematics contributes to the development of rigorous logical thinking (one of the most common and important developmental goals of mathematics lessons. Deductive thinking, abstraction, generalization ability, ability to think, analyze and criticize - these all are considered components of academic competence that have been developed by mathematics teachers all the time.

Secondly, mathematics uses general scientific methods of knowing the world, and at the same time it is a method of knowing the world. So, while learning mathematics, students master these methods to one degree or another. Mathematical modeling is one such method.

Thirdly, by solving theoretical and practical problems, mathematics teaches to distinguish a problem, to find its solution, to realize it, to evaluate it, which is a very important component of educational competence. We would like to emphasize that mathematics teaches to achieve a set goal without bowing down in the face of difficulties.

Fourth, mathematics develops imagination and intuition, research and creative abilities.

And finally, fifthly, with the help of mathematical tools, it is possible to form the competence and ability to read throughout a person's life, which is one of the most important aspects of a competent approach. This is confirmed by the fact that the graduates of the Faculty of Mathematics are able to quickly and efficiently master any related professions.

The system of qualifications that determines the competence of a student's competent approach includes a set of qualifications aimed at distinguishing the object of study, planning and organizing relevant activities. In this complex, in turn, it is possible to "see" what was already known in the news, to "see" the features and possibilities of applying the methods that have become known in the activity to newly studied objects. skills related to determining the directions of realization of these opportunities and their evaluation are distinguished.

The teaching of mathematics should be more focused on the formation of the listed skills than the teaching of any other subject. The fact is that the educational subject "mathematics" is not a certain amount of knowledge (definitions of concepts, facts, properties, signs of concepts, methods of solving some sample problems), but a method of learning multiple objects, offers a method for determining the relationships between the knowledge that describes the studied objects. The process of mastering this method is essentially the process of forming the skills we have highlighted. The question is how to organize this process.

"Seeing" what is already known in the news, searching for opportunities to apply the methods known in the activity in new situations, requires compliance with a number of conditions. The main of these conditions are:

The process of mastering the material by students should be organized as a heuristic research process, solving problems related to knowledge. Mandatory components of this process: researching the proposed situation, putting forward hypotheses, confirming them (developing rejection strategies, choosing the priority strategies for their implementation and their implementation, checking, checking the validity of the obtained conclusions, describing the method of solving the cognitive task.

In the process of forming such skills, it is necessary to carry out purposeful and continuous work on the systematization of students' (not only factual, but also methodological) knowledge.

In learning mathematics, this can be done by solving problems that we call competence.

It is necessary to distinguish the subject competence of the teacher and the subject competence of the student.

The subject competence of the mathematics teacher is a component of his professional competence, which ensures the effective implementation of the subject (mathematical) activity, which forms the meaningful basis of the professional activity of the mathematics teacher as a science teacher.

Competencies related to the subject - specific abilities that are necessary for the successful and effective implementation of certain behavior in the field of a certain subject and include narrow specialized knowledge, skills related to a particular subject, and ways of thinking.

The student's mathematical (subject-related) competence is the ability to structure data (situation), distinguish mathematical relationships, create a mathematical model of the situation, analyze and change it, and interpret the obtained results. In other words, the student's mathematical competence helps to adequately apply mathematics to solve the problems faced in everyday life.

It was said above that the sum of competencies, knowledge and experience necessary for effective activity in the field of the given subject is called competence. Competence is manifested in the situation of applying knowledge and skills in solving problems different from those for which this knowledge has been mastered. the competence of an individual in the field of certain competencies is determined by the level of his achievements in that field. In other words, the student's mathematical competence helps to adequately use mathematics in solving problems encountered in everyday life.

On the example of the stereometry course, we highlight the components of the student's competence in the subject:

- modeling in space (proper execution of drawings of three-dimensional figures on the plane, skills of construction of body models);
- metric ratios (knowing formulas, finding magnitude, evaluating it, comparing magnitude sizes);
- translating a natural (linguistic) text into a formal-symbolic one and vice versa (for example, when solving issues related to competence);
- sorting and applying the necessary stereometric knowledge to solve the situation.

The student's competence in the field of mathematics allows him to provide a more generalized and creative approach to any mathematical problem. Competency issues involve the application of familiar skills in situations unfamiliar to students.

In a competent approach to teaching geometry, the focus is on the logic of problem solving, the separation and analysis of theoretical areas of knowledge, the forecasting of the solution process based on the known methods and methods of solving this or that problem (imagining it in a schematic way in the mind). it rots.

The geometry lesson differs from other lessons in that a large number of mathematical problems are solved during the study of any subject. For this reason, it is necessary to develop competence in many ways with the help of problems. One of the main competences actively developed in geometry classes is learning competence, because it is related to the basic type of student activity - learning activity.

There are different names and definitions of issues aimed at forming and checking students' competencies. They are competent-oriented, situational, contextual, etc. they call names. We treat these issues as competence issues.

Methodical processing of competence issues means: ability to distinguish results related to knowledge obtained from problem solving; to determine redundancy, contradiction in the condition of the issue (given); "reading" information presented in various forms; selection of necessary (both mathematical and non-mathematical) knowledge for solving, as well as the skills of turning traditional mathematical problems into competence-related ones

Competence-related issues that are considered in teaching mathematics are understood as issues whose solution is to solve a standard or non-standard

(subject-related, interdisciplinary or practical, depending on the content described in it) situation with the mandatory use of mathematical knowledge. The main feature of such problems is to obtain a knowledge-related result for the student and a professionally significant result for the student - the future teacher of mathematics.

The difference between competence-related problems and standard (subject-related, interdisciplinary, practical) mathematical problems:

- the significance of the obtained result (cognitive, professional, general cultural, social), which ensures the student's motivation to learn;
- the fact that the condition of the problem requires the application of knowledge (related to different branches of mathematics, other sciences or life) to solve it, which is not clearly indicated in the text of the problem, is formulated in the form of a plot, situation or problem;
- the fact that information and data can be given in different forms (pictures, tables, schemes, diagrams, graphs, etc.) requires recognition of these objects;
- it consists in indicating the field of application of the result obtained from solving the problem (clear or hidden).

In addition to the four mandatory specificities listed, issues related to competence can satisfy the following requirements:

- according to the structure, these issues are non-standard, that is, in the structure of the issue, some of its components are definitely unclear;
- presence of excess, insufficient or contradictory (contradictory) information in the condition of the issue, which leads to voluminous formulation of the condition;
- the existence of several methods of solution (different levels of rationality), in this case, these methods may be unknown to students and their construction is required.

The competence of the issue can be differentiated according to the level of complexity:

1. Problems of the first level of complexity - problems for solving which one standard mathematical idea is used in a mathematical, interdisciplinary or specific life situation.

Problem. After 7 washes, the household soap shrunk twice in length, width and height. The soap lasts for several more washes.

2. Problems of the second level of complexity - problems that require a combination of mathematical, interdisciplinary or a combination of several mathematical ideas in a specific life situation.

Matter. 8x10 house builders want to build an equilateral roof. They built columns 3 m high perpendicular to the roof surface. If one bundle of tiles is enough to cover a surface of 2.7 m2, how many bundles of tiles are needed to cover the roof.

3. Problems of the third level of complexity - the mathematical idea for solving is implemented by means of non-standard solving methods.

Matter. There are several bricks of the same size. Find a way to measure the diagonal of a brick using a ruler.

4. Problems of the fourth level of complexity are problems that require a creative approach to solving, and the solution of these problems requires research.

Matter. In geometry, there is the following theorem: "A tetrahedron has the smallest surface among all pyramids with equal sides for a given volume."

A) You are the organizer of a new firm N that manufactures containers for dairy products. Convince dairy producers that tetrahedron-shaped containers are beneficial for them.

B) You are a competitor of firm N. Convince dairy producers that tetrahedron-shaped containers are not useful for them.

C) The milk package is in the form of a tetrahedron and the edge is equal to 15 cm. Draw this packet spread on a scale of 1:5,

D) Calculate the costs (in m2) of producing 100 milk packets from C) above.

Competence issues can be divided into intra-subject, inter-subject and practical issues in terms of types.

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