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PRECONDITIONS FOR COMPILING PRACTICE-ORIENTED ASSIGNMENTS IN MATHEMATICS

Zhenisbek Nakypbek, masters student
Suleyman Demirel University, Kaskelen, Almaty, Kazakhstan

Abstract

It is no secret that today most educational institutions are gradually reorienting to the educational standards of the third generation. In this regard, there is a problem of training qualified specialists for the society, focusing on mathematics as a fundamental and popular science. The professional orientation of training allows us to consider mathematics, firstly, as a means by which you can design the process of profile-oriented training, and secondly, as a form of specific interdisciplinary relationship of general and professional knowledge. Based on this, the development of students' intellectual skills in designing and modeling mathematical models is considered particularly relevant at the present time. Therefore, a systematic approach to teaching mathematics on the basis of practice-oriented teaching, which has already proved itself in the framework of experimental application and in elective classes in mathematics, is becoming particularly relevant today.

Түйіндеме

Бүгінде білім беру мекемелерінің көпшілігі үшінші буынның білім беру стандарттарына біртіндеп бағытталып жатқанының жасыратыны жоқ. Осыған байланысты математикаға іргелі және сұранысқа ие ғылым ретінде назар аудара отырып, қоғамға білікті мамандар даярлау проблемасы туындайды. Оқытудың кәсіптік бағыты математиканы, біріншіден, бейіндік-бағдарлы білім беру процесін жобалауға болатын құрал ретінде, екіншіден, жалпы және кәсіптік білімнің нақты пәнаралық байланысының формасы ретінде қарастыруға мүмкіндік береді. Осыдан студенттерде интеллектуалды дағдыларды дамыту және математикалық модельдеу қазіргі кезде өзекті болып саналатындығы шығады. Сондықтан, қазіргі кезде эксперименттік қолдану шеңберінде және математикадағы элективті сабақтарда өзін дәлелдеуге қол жеткізген тәжірибеге

бағытталған оқытуға негізделген математиканы оқытудың жүйелік тәсілі ерекше өзекті болып отыр.

Аннотация

Не секрет, что сегодня большинство образовательных учреждений постепенно переориентируются на образовательные стандарты третьего поколения. В связи с этим возникает проблема подготовки для общества квалифицированных специалистов, акцентируя внимание именно на математике как на фундаментальной и востребованной науке. Профессиональная направленность обучения позволяет рассматривать математику, во-первых, как средство, с помощью которого можно спроектировать процесс профильно-ориентированного обучения, во-вторых, как форму специфической межпредметной взаимосвязи общих и профессиональных знаний. Исходя из этого, особо актуальным в настоящее время считают развитие у учащихся интеллектуальных навыков конструирования и моделирования математических. Поэтому сегодня особо актуальным становится систематический подход к обучению математике на основе практико-ориентированного обучения, которое успело себя уже зарекомендовать в рамках экспериментального применения и на факультативных занятиях по математике.

Introduction

Modern society is changing its views on the content of mathematics education. The main focus is on developing the ability of students to apply the knowledge and skills acquired at school in life situations. Today we need functionally competent graduates who are able to enter into relations with the external environment, quickly adapt and function in it.

A new approach is being implemented in the system of modern education at all levels of education. Teachers abandon the reproductive method of teaching and use developmental technologies and a competence-based approach. These technologies are designed to form, along with subject knowledge, universal learning actions for students. In mathematics lessons, the implementation of the competence-based approach is carried out through the use of practice-oriented tasks, as well as activity and competence-oriented tasks.

The most important type of educational activity in teaching mathematics to schoolchildren is problem solving. The presentation of educational material in textbooks (even in the latter) remains most often informational, they contain few assignments of a variable nature, assignments for the creative activity of students, both when studying new material and when applying the knowledge and skills acquired.

The implementation of this requirement provides for the orientation of educational systems to the development of students' qualities necessary for life in modern society and the implementation of practical interaction with objects of nature, production, and everyday life. An important role in the system of preparing students for the application of the acquired knowledge for practical purposes belongs to the study of the school course in mathematics, since the universality of mathematical methods makes it possible to reflect the connection between theoretical material and practice at the level of general scientific methodology. This determines the importance of mathematics in the formation of students' skills to solve problems

that arise in the process of human practical activity. This is the relevance of the topic under consideration.

As Confucius said “Tell me - and I will forget. Show me - and I will remember. Let me act myself - and I will learn” [1].

The concept of a practice-oriented assignments

Currently, the term “assignment” is widely used, both in life and in science. This term denotes many and very different concepts, but today there is no general definition of the concept of “assignment”. To implement the goals of practice-oriented learning, it is necessary to include tasks with practical content in the educational process. They show the applied nature of mathematical knowledge, activate mental activity, and develop an interest in mathematics as a subject. In the educational and pedagogical literature, there are a variety of approaches to the concept of a task. Titova E. I [2] believes that the simplest definition of the problem was given by the famous teacher-mathematician S.O. Shatunovskiy. It reads: “The task is a statement of the requirement to” find “by” given “things other” sought “things that are to each other and to these things in the specified proportions”. It is assumed that the concepts “thing”, “find”, “data”, “sought” in each individual case are specially defined.

In a broad sense, an assignment is viewed as a problem situation with an explicitly set goal that must be achieved. In a narrower sense, an assignment is also called the goal itself, given in the framework of a problem situation, that is, what needs to be done.

L.M. Friedman clearly expresses his point of view. For him, an assignment is a problematic situation, which is expressed using signs of a natural or scientific language. He believes that if the subject, when performing any activity on his way, encounters difficulties, then a problem situation arises as a result. This means that the problematic situation is not just the difficulties that arise on the way of the subject, but his desire and desire to eliminate them

[3]. Therefore, the subject is an element of the task, who has realized the difficulty in his activities.

L.M. Friedman clearly distinguishes between the concept of an assignment and a problem situation on the following grounds:

- A problem situation is always richer in content than an assignment, because an assignment is a model of a situation that reflects only some of its sides;
- For each problem situation, there is one or several tasks that may differ from each other both in the set of the situation properties presented in them, and in the language in which the task is expressed;
- The problem situation exists in reality, regardless of any language, and the assignment is always associated with the language in which it is stated [3].

Thus, in our work, under the term "assignment" we will consider a problem situation, including a goal and conditions for its achievement.

Methodists-mathematicians D. Poya believed, L.M. Fridman, G. I. Sarantsev, and psychologist V.V. Davydov, specially selected tasks help to form the ability to solve problems. In our work, we will call them practice-oriented assignment.

A practice-oriented assignment is understood, first of all, as a textual mathematical task, in which four main components are distinguished:

1) condition – initial state;
2) basis of the solution - the theoretical basis of the solution;
3) solution - transformation of the condition of the problem to find the required one;
4) conclusion – the final state.

Practice-oriented assignment are tasks from the surrounding reality that are closely related to the formation of practical skills necessary in everyday life [4].

Practice-oriented learning as a necessary component in teaching mathematics in the context of the introduction of new standards

Currently, there is a need to create a vocational training system focused on the individualization of training and socialization of students, taking into account the real needs of the market. When creating such a system, mathematics as a fundamental general educational discipline is assigned a special role in the formation of the professional orientation of education.

In some cases, teaching mathematics can be considered as a connecting discipline of general education and professional knowledge. This is especially true when shaping professional thinking with the help of mathematics. Such professional thinking can be conditionally designated as technical thinking or socio-economic thinking, depending on the professional orientation of students.

Self-formation of thinking can occur both directly through the applied nature of the mathematics course, and indirectly through teaching the processes of mathematical modeling and mathematization of arbitrary situations.

Practice-oriented teaching technology allows a student to be turned from a passive object of pedagogical influence into an active subject of educational and cognitive activity. The main means of implementing the practice-oriented (applied) direction of the mathematics course is a specially selected system of problems.

The didactic goals of practice-oriented assignments:

- Consolidation and deepening of theoretical knowledge.
- Mastering the skills and abilities in the academic discipline.
- Formation of new skills and abilities.
- Bringing the educational process closer to real life conditions.
- Study of new methods of scientific research.
- Mastering general educational skills and abilities.

- Development of initiative and independence.

Types of practice-oriented tasks in mathematics:

- Analytical (goal definition and analysis);
- Organizational and preparatory (planning and organization of individual, group or collective work on the creation of objects, analysis and research of the properties of objects of labor);
- Evaluation and correction (to form an assessment of actions and to correct the process and results of activities, to conduct a small search for ways to improve activities) [5].

Conclusion

One of the points of modernization of modern mathematics education is the strengthening of the applied orientation of the school mathematics course, i.e. linking its content and teaching methods with practice.

To implement the goals of practice-oriented learning, it is necessary to include tasks with practical content in the educational process. They show the applied nature of mathematical knowledge, activate mental activity, and develop an interest in mathematics as a subject.

Practice shows that one of the most effective ways to develop subject literacy is practice-oriented tasks. Tasks that reveal the applications of mathematics in the reality around us, in related disciplines, acquaint with its use in the technology and economics of modern production, in the service sector, in everyday life, when performing labor operations. Methods for presenting statistical data. Working with tables, diagrams.

In addition, solving problems of practical content can instill a student's interest in the study of mathematics. Such assignments change the organization of the traditional lesson. They are based on knowledge and skills, and require the ability to apply the accumulated knowledge in practice.

The development in schoolchildren of the ability to solve practice-oriented problems in the process of teaching mathematics should be considered as one of the ways to form their functional literacy. Such an approach to teaching allows the graduate of the school in the future to solve problems that arise in life and in professional activity.

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