

Scientific and methodological foundations of professionally-oriented teaching of mathematics to students of agricultural direction

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Abstract: The education system has been fulfilling its function for many years, creating a system of education that corresponds to it. In particular, we can say about the content of the mathematics course and the structure of the course, teaching methods, use in the traditional form. Currently, teaching a mathematics course to undergraduate agricultural students who are not mathematicians is a problem for teachers. Its reason can be explained by the negative attitude of the vast majority of students of this direction to mathematics: “in the process of studying, students do not understand mathematics or do not understand any stage of training; the lack of simple and reliable mathematical examples that can be applied to a future profession.” Therefore, there is a need to update the teaching status of the current mathematics course.

Keywords: agricultural direction, students, mathematics, information technology, educational process, competence, education, independent work, learning technology.

1. Introduction

Today the problems of education and training of specialists are becoming acute, improving the quality of education that meets the requirements of the new society. In accordance with such new requirements, our society is in urgent need of training a new generation of competent professionals with fundamental knowledge in the professional field. This is especially relevant in a multi-level (bachelor - master) and multidisciplinary system of higher professional education, since it is aimed at the formation of general fundamental training and professional competence through in-depth training in profiles.

Within its framework, the formation of mathematical competence is also of particular importance for students of agricultural profiles, since it provides a methodological basis for other knowledge, being universal for all professions. Therefore, when teaching a mathematics course for agricultural students, the requirement is again put forward to update the technology of his training, focused on the future profession.

Although the above-mentioned studies on the content of education and forms of education have already been conducted, in accordance with the requirements of the new state standard, it is also possible to justify the fact that the issues of teaching mathematics courses for students of

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agricultural specialties in order to orient them to their future profession have not been fully studied [1].

Currently, teaching a mathematics course to bachelor's degree students of an agricultural profile who are not mathematicians is a problem for teachers. Its reason can be explained by the negative attitude to mathematics of the vast majority of students in this field: “in the learning process, students do not understand mathematics or do not understand any stage of learning; the use of mathematical techniques is impossible to the full extent; the lack of simple and reliable mathematical examples applicable to the future profession.”

Unfortunately, they don't care about this aspect, and most of them don't even remember how they use mathematics in possible fields. Thus, the teaching of mathematics is dominated by formalities and an abstract approach. That is why a number of problems arise in modern technology, in the discoveries of sciences and in practical activity. Therefore, there is a need to update the state of teaching a modern course of mathematics.

The Bologna process, the competence approach, the fundamentalization of education, global information (information) — all these problems have merged into one complex node. The task of modern higher education institutions is to solve this problem skillfully. What needs to be changed in training, what needs to be saved? How can we make it an instrument of competent and high-quality education by combining innovative and traditional approaches to learning? Answering this question, it is possible to solve the main didactic problems of higher education.

2. Materials and methods of research

Currently, higher educational institutions are faced with the task of training agricultural specialists with a new innovative culture, who have knowledge, the ability to think independently and outside the box, work in a team and in a team. This, on the other hand, requires students to have more autonomy in decision-making, problem solving, efficiency and avoiding standards in problem solving. In any case, agricultural specialists should be familiar with the basics of mathematical knowledge in the necessary and sufficient volume in accordance with their specialty.

The purpose of the research is to develop a new technology of orientation teaching mathematics course for agricultural students in accordance with the requirements of the new generation state standard and substantiate the conditions for its implementation in the educational process.

The mathematics course is taught as a compulsory subject in accordance with the state educational standard. Each educational institution has special departments of “mathematics and computer science” that serve these subjects and are equipped with appropriate specialists, if possible. But at the same time, for teachers of mathematics courses in these departments, who?, why?, how many? and how to teach?,- there are eternal and relevant questions of didactics for each new situation.

Therefore, what is the content, to what extent and how to teach the course for new students of this mathematics course? - legitimate questions of didactics do not necessarily create a problem in the educational and methodological environment for each mathematics teacher of newly created departments [2].

Having conducted a study of the state of the mathematics course taught to bachelor's degree students of the agrarian profile, it was found that the organization of the educational process in it is carried out with significant drawbacks, the process of teaching the current course of mathematics is based on old standards and technologies.

Firstly, it is carried out according to an unreasonably shortened version of the program of the times of the former Soviet Union. Even the original versions of the old standard programs have not been preserved at the departments, and the modern educational process is carried out on the basis of a work program compiled in accordance with the content of textbooks called

“higher mathematics course” written in old Russian. In accordance with it, the content previously traditionally taught is provided for students of natural science and agricultural profiles, in other words, program materials on the general theoretical foundations of the higher mathematics course are taught.

Secondly, textbooks, teaching aids, didactic means of teaching mathematics courses are still implemented using classical literature written in Russian (although training is conducted mainly in Kyrgyz).

Thirdly, the teaching technology consists in the fact that the teacher's lecture is conducted by the methods of taking notes, mechanical memorization and repetition by students, while teaching a course of mathematics is not fully taken into account in order to focus on the future profession in the specialty.

Fourth, the “efficiency coefficient” of mathematical education remains very low due to the lack of interest of students in the full assimilation of the mathematics course (due to the lack of motivational orientation).

The means of eliminating such shortcomings is the professional training of mathematics specialists-not materials, a characteristic feature of which is the widespread use of mathematical methods in solving practical problems and conducting scientific research in various specialties (including bachelors of agricultural profile) [3].

3. Research results

What kind of mathematics to teach and how to teach future professionals? How to change the content and methodology of teaching mathematics in modern conditions in order to bring graduates of higher educational institutions to the appropriate level of competence?

Based on the above, we will distinguish two conditions for the formation of knowledge and skills of students in the course of mathematics:

- successful interdisciplinary interaction of the course of mathematics with other courses;
- the content of applied problems in the course of mathematics.

Professional training is a set of special knowledge, skills, skills, work experience and discipline standards that ensure successful work in the acquired profession. For this reason, the basic educational environment that determines the quality and nature of the final result in preparation for the profession is.

The purpose of teaching mathematics courses to Bachelor of agricultural profile students is the introduction of a training technology designed to form the professional competence of a graduate in order to orient him to a specialized profession.

All this regulates the high level of achievement of the results of modern education with the formation of motives, values, mathematical knowledge, skills, experience of activity, quality of thinking that make up the content of the structure of mathematical competence of students.

It should be noted the peculiarities of teaching mathematics to bachelor students of agricultural profile. The main important areas related to the first problematic trends:

- ✓ the natural potential of mathematics is part of culture;
- ✓ technological approach to teaching math reading;
- ✓ application of information technology training;
- ✓ strengthening the interest (motivation) of agricultural students to study mathematics.

The second trend is to increase the attention of students to independent work, increase the self-esteem of the majority of the population through the introduction of information technologies in all life situations of society, the purpose of education is self-realization and self-determination of the individual, independent learning to read using various information sources.

Training should be properly aimed at understanding conceptual issues, primarily in combination with mathematics [4].

In the emergence of agricultural knowledge, many qualitative statements and proofs were obtained without the use of mathematics. For example, the basic state of formal genetics. They had the opportunity to systematize experimental material without using mathematical apparatus. However, the use of mathematics has not completely disappeared. Currently, agricultural knowledge has appeared in a very precise and meaningful form, formulated in the language of mathematics, with a new perspective that attracts attention. The current situation has changed dramatically. In biology, chemistry, etc. in agricultural knowledge, it is necessary to build a mathematical model of processes that will be monitored as their quantitative and qualitative indicators grow.

Modern methods of orientation teaching mathematics courses, with the help of information technology, increase the possibilities of retraining people in the profession, self-improvement of professional knowledge. They have the ability to creatively process an ever-growing data stream and are ready to use it competently in practice. The solution of this issue is directly related to the search for new forms, methods and means of education that provide broader opportunities for personal development, opportunities for self-development and self-realization. This is caused by new academic programs (bachelor's and master's degree).

Despite the fact that agricultural students in higher educational institutions are aware of the need to form Internet education, the process of creating an appropriate material base and training teachers is very slow. This is primarily due to the lack of understanding by the administration of higher educational institutions of the prospects for the use of modern information technologies, as well as the low level of qualification of teachers who, in the absence of a retraining system, do not accept new knowledge on their own. But it is these higher educational institutions that in the near future should become the cradle of the formation of Internet-oriented consciousness among young people. It is the universities that should financially support this process, the teacher should rely in his activities on both traditional and non-traditional teaching methods.

4. Discussion

In order to orient general education subjects to a future profession in a higher educational institution, it can be noted that the technology of teaching is still not a broad subject of study in didactic science. A well-known Belarusian didactic scientist, Professor M. N. V. Potocki, wrote about him: "it is a pity that the pedagogy of higher education (for example, teaching mathematics) has not yet been fully formed in our country. There are also points of view that this is not even necessary. We are of the opinion that only every lecturer knows how he will read the course. Consequently, teaching mathematics is the conscience of every teacher..." [8].

In our pedagogical practice, it has been proved that when teaching bachelor's degree students of the agricultural direction to the course of mathematics, taking into account the specifics of the listeners, the flexible application of the principles of "prevention", "visibility", "continuity" will be very effective for them. Due to the limited hours allotted for the course, it is necessary to apply the principles of "prevention" and "visibility" to obtain and memorize the basic materials that will be presented at the lecture. Let's analyze the program of the mathematics course and use the proposed didactic task "triune – one whole".

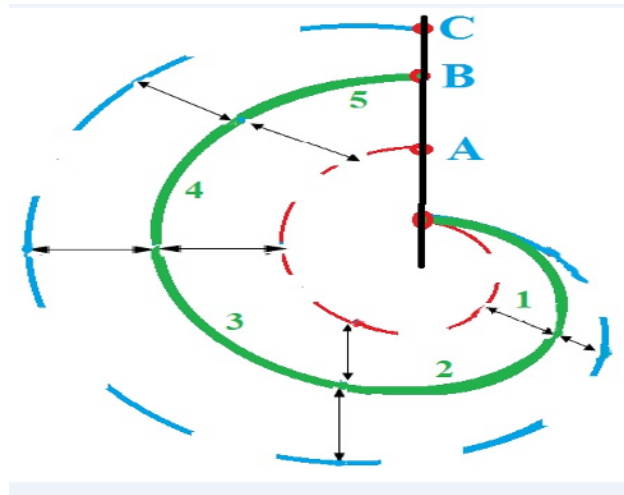


Fig 1. Technologies of teaching mathematics course
A conditional model of the "triune-one whole" problem.

Most importantly, in each lecture, the above-stated task “triune - a single whole” should be implemented: establishing the connection of materials with the practical, professional sphere of the future profession, systematic and simple presentation of the materials of the main course in the order of questions and answers, discussions with its use, correct and complete implementation of arithmetic calculations, the responsibility of the lecturer.

In mathematical education for students of agricultural profiles, the purpose of students' educational activities is not only the acquisition of mathematical knowledge, but also the development of their professional qualities based on mathematical logic. For students of specialized areas, only then will it contribute to the successful organization of the educational process in mathematics and provide effective conditions for its formation.

5. Conclusion

As a result, the following problems can be solved:

1. Search and search for data to improve the learning process. E-books, magazines, various identifiable materials on the Internet.

2. Create a special multi-environment, which will include various information flows: visual, audiovisual, text. They contribute to the improvement of the learning process and prepare students for the future profession, leading to a conference of sensory channels that receive data.

3. There is an educational and methodical complex of teaching mathematics on the Internet. This allows the use of interactive teaching methods (online exercises, virtual role-playing games, educational discussions, debates).

4. Development of identical, compatible teaching aids for full-time and part-time students. This is due to the fact that Internet technologies allow students to constantly communicate with their teacher remotely. Contact your teacher to get advice, complete assignments, find tests, etc. B.U.S. can be solved.

5. Improving the culture of using Internet technologies by students. You can compare traditional methods of teaching mathematics with Internet technologies. Traditional methods are lecturing, conducting practical, laboratory classes, where the main role is assigned to the teacher. He teaches students the conceptual basics. And the Internet itself provides the necessary information.

The computer form of learning develops its own type of obtaining new information. It allows each student to independently choose the method of study, choose the time at their discretion. This form of training implements the didactic principle of harmonization of individual and collective types of training. Each student needs a separate time to understand new information: one needs more time, and the other needs less [6].

Of course, all of the above requires a lot of methodical work from the teacher, creative search, the ability to correctly and in their place pose problematic issues and create problematic situations, at the same time, students are required to search, interest in the subject and material in the lesson, deep thinking qualities.

Problematic situations are created, and questions such as “why”, “how could it be”, “why did it happen”, “what do you think”, “how would you answer”, “how would you solve this problem”, “how would you get out of this situation” are asked students not only in order to uncover the unknown, but also after some Nodal, curious problem has been solved, they sit.

One of the main reasons why a bachelor's degree student of an agricultural profile lacks full effectiveness in teaching mathematics is that didactic and methodological principles are violated. For example, such shortcomings arise when explaining mathematical theories. When, where and why did this theory arise? What does it matter in life? What is the place of mathematics in science itself and what is its development? Is this theory applicable to an agricultural student? questions such as "what to do?" are asked, and the answers to them are not always obtained together with the students.

As a result, although some lectures will be perceived as a mathematical definition for students- a long chain of theories, equations, rules — and not as mathematics -an agricultural bachelor's student will not have an interest in mathematics for future professionals. A person interested in knowledge understands the meaning of something unfamiliar, a phenomenon (if it does not belong to a narrow scientific, professional circle and does not cause too difficult a question to study), does not bother to reveal secrets, searches for it in various sources, interviews knowledgeable [7].

If a new technology for teaching this course and modern tools that meet modern requirements are developed in order for future bachelor's degree students of the agrarian profile to have a sufficient level of culture of mathematical education, then the quality indicators of students in relation to the formation of their future professional competence should increase dramatically.

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