

# *Mathematics Teaching Technology for Humanitarian Students in Pedagogical Heu*

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**Abstract** – The article discusses the problems of teaching mathematics in higher education for humanitarian students in the context of new educational standards and the reduction of hours allocated to the study of the discipline. The results of the introduction of distance learning educational complex based on a combination of contact work with students and distance learning methods are presented. The purpose of the study is empirical confirmation of the hypothesis about improving the quality of students' learning of material with the systematic use of innovative forms of training based on the use of distance learning technologies and on an individual approach to each student.

**Keywords** – Mathematics, Competency-Based Approach, Individual Approach, Educational And Methodical Complexes, Teaching Efficiency, Methods Of Teaching Mathematics, Methods Of Mathematics At A University, Students.

## I. INTRODUCTION

One of the main tasks of higher education in Uzbekistan is the training of highly qualified specialists with fundamental scientific knowledge and applied skills in their professional field. This also applies to mathematical training, which is important for a number of areas, not only technical, but also humanitarian. An analysis of studies reflecting the problems of modern HEUs suggests that changes are taking place at the methodological, institutional, substantive and technological levels: these are new approaches to building educational systems, globalization of education, a competency-based approach to developing higher education content, new training standards, variable modular core professional educational programs, etc.

For the formation of all necessary competencies, mathematics has a great potential - as a fundamental science. Due to the specificity of its content, this academic discipline forms the students' ability to self-education and self-development, unconventional information handling, the ability to plan and constructively evaluate their actions and

actions, make decisions in standard and non-standard situations, work in a team, develops the ability to quickly and easily the construction of mental actions, the ability to reasonably expose one's thoughts and ideas, to multilevel cognition and a comprehensive understanding of the essence of the problem and other qualities that make up the model of a modern specialist [3].

However, mathematics is one of the most difficult disciplines studied for example by humanities students. In most cases, this is due to its incorrect teaching at school - superficial, without explaining the basics and laws of certain mathematical phenomena, the lack of practical examples and explaining the need to study it for each person, which ultimately forms a fear of the subject for life.

What could be the way out of this situation? An analysis of the existing methods of teaching mathematics to students of humanities allowed us to identify several approaches, one of which is a pragmatic concept that suggests selecting mathematical material based on the real needs of each specific humanitarian direction. This approach is really

useful for students of a particular specialty and can arouse their interest in the course of mathematics, and it will make it possible to single out those who want to further deal with the problems of mathematizing their field of knowledge. But the implementation of this approach, according to many experts, requires a long and painstaking preliminary work of professional mathematicians. That is why experts note the lack of successful teaching and methodological complexes in mathematics, oriented to a certain humanitarian direction. This concept of teaching mathematics for the humanities seems most appropriate. In this regard, the task was set to develop a teaching and methodological complex in mathematics for students in the humanities. Due to the above problems: different abilities, interests, level of pre-university training, this approach seems to be the most relevant. It should also be noted that the successful implementation of such a course in the context of a decrease in class time with a simultaneous increase in independent work and a low level of formation of students' independent activity skills is impossible without the use of modern remote technologies. Their use contributes to the improvement of the educational process in a methodological sense through the use of webinars, interactive teaching methods and to improve the quality of education in general. The introduction of modern information technologies in the educational environment of the university helps to reduce the cost of implementing the educational process [2], for example, by saving the classroom fund and material and technical resources, and this, in turn, allows attracting highly qualified teachers.

As was shown in [1], in practice, such an approach to the construction of the educational process allows you to take into account the variability of the curriculum and mobility of the modern student and teacher, allows you to organize independent work of students and objective verification of knowledge, provide access to a selection of necessary literature and organize effective Interactive communication between all process participants outside HEU.

For several years, Tashkent State Pedagogical University has introduced and successfully uses its own e-Learning system, which allows to increase the level of student involvement in a single educational environment and to improve the quality of education based on an integrated approach to the formation of training courses.

When developing the course, the author proposed and implemented a comprehensive approach to the formation of mathematical skills. Its distinctive feature is the use of three main components:

- I. Information-educational elements of the course;
- II. Control and measuring elements of the course (intermediate and final control);
- III. Communicative elements that allow you to implement feedback in the "online" or "offline" modes.

The development of the content of the course was based on many years of experience in teaching mathematics at TSPU for first-year students of the humanitarian direction of education. Over time, the system of secondary special and higher education in Uzbekistan changed, which required a review of the entire methodology of teaching the discipline.

A significant reduction in class hours is becoming a trend in modern state educational standards. In this case, the teacher poses several tasks at once: to bring the learning outcomes to the required level, to effectively use the hours allocated by the curriculum for independent work, and to organize joint work in such a way as to take into account the different levels of school mathematical knowledge.

The experiment began with the results of a survey of first-year students before the winter certification (after the end of the first semester) in 2018, which showed that more than 80% of the respondents found difficulty in mathematics (41 out of 50 students answered this way). At the same time, difficulties in mastering the discipline were, in their opinion, related to poor pre-university training in mathematics, the intensive pace of studying the discipline (for one semester according to the curriculum, four hours a week), and the lack of modern textbooks accessible to humanities.

Entrance testing of first-year students in the next three years (2018, 2019, 2020), which the author conducted as part of a planned experiment, confirmed that the indicated difficulties naturally arise in yesterday's students who entered HEU for humanitarian studies. So, as a result of testing, the following data were obtained:

- In 2018: they did not know what the limits and derivatives were - 67%; did not know the graphs and properties of the basic elementary functions - 55%; did not know the concepts of combinatorics and probability theory 90%; did not know the basics of algebra (could not solve quadratic equations, could not work with logarithms and power expressions) 83%.
- In 2019: they did not know the theory of limits and differential calculus - 81%, did not know the graphs and properties of the basic elementary

functions - 57%, did not know the concepts of combinatorics and probability theory 91%, did not know the basics of algebra (did not know how to solve quadratic equations, could not work with logarithms and power expressions) - 57%.

In practice, paradoxical situations have occurred when difficulties were found by finding the square root of unity, adding and multiplying negative numbers.

- In 2020, there were some changes, as many students studied in secondary schools for 11 years, having received some mathematical literacy: they did not know what the limits and derivatives were - 51%, did not know the graphs and properties of the basic elementary functions - 21%, did not 60% knew the concepts of combinatorics and probability theory, did not know the basics of algebra (did not know how to solve quadratic equations, did not know how to work with logarithms and power expressions) 45%.

As a solution to the problems identified and taking into account the wishes of students, it was proposed to develop a comprehensive course that combines both the classroom and distance component. The experience of developing and introducing into the educational process the specified course in the discipline "Mathematics" formed the basis of the experiment described in this article.

At the first stage, a lecture course was adapted containing a discussion of all the topics required by the program and the standard: theoretical material was supplemented by a variety of professional examples, supplemented by presentation methodical materials to visualize the most difficult to understand topics and facilitate the perception of the material presented.

In a similar way, they were developed and presented in teaching materials on all topics of seminars, as well as tasks for independent implementation of practical work and on options.

In 2019-2020, all the prepared material was placed in a distance course (and already in the spring of 2020, lectures and seminars began to be conducted remotely in the form of zoom conferences (within the hours planned by the curriculum)).

Modules were developed, which was a combination of a short theoretical course and testing.

According to the results of certain types of work in the distance course, students received points.

Over the years of work according to the method developed by the authors (distance learning was used only at the last stage), the following results were obtained:

1. Testing of student attitudes toward the subject, conducted as part of this experiment with all freshmen over three years, showed a significant decrease in psychological tension.

The questionnaire was conducted at the beginning (in the second or third week) of training and again at the end of the course (two to three weeks before the final certification). According to the results of the survey, the number of students who noted significant difficulties in mastering the "mathematical" disciplines decreased from 79% to 36%.

2. Indicators of the level of mastery of the discipline have also changed compared to previous years.

Thus, the use of the course developed by the authors in the educational process allowed:

- Significantly reduce the psychological tension of students and their negative perception of the subject, as they saw concrete help in filling knowledge gaps and realized that the university takes into account the humanitarian characteristics of their personality;
- Organize additional consultations with the teacher on the subject as part of remote online and offline communication, which allowed to take into account the wishes of students and not go beyond the curriculum of the direction;
- Fully use the hours allocated by the curriculum for independent work of students: additional classes were held for the lagging;
- Redistribute the time of the teacher: the hours that were spent on checking the intermediate works were allotted to distance consultations and accompaniment of lagging students. Students knowledge control was carried out automatically using tests;

It is worth noting that for the teacher, such an organization of the learning process required a lot of time and labor at the initial stage of development and creation of the course. Subsequently (when using the finished course), the time spent on its management was mainly associated with the need to make small adjustments to certain topics of the modules, to review the students' "performance".

The results of the study allow us to conclude that the mathematical training of humanitarian students is possible due to a combination of distance and classroom methods of

work, providing an individual approach to each student and not only ensuring that the learning outcomes are consistent with the competencies stated in the state standard, but also following the concept of the development of mathematical education in Uzbekistan.

**REFERENCES**

- [1] Gazizova N.N., Nikonova G.A., Nikonova N.V. Teaching-methodical set in mathematics for students of a technological university // Higher Education in Russia. - 2018. - No. 2. - S. 56–61.
- [2] Zagitova L. R. Practice-oriented mathematical education // Higher education in Russia. - 2016. - No. 8–9 (204). - S. 123–127.
- [3] Latypova A.R. The role of mathematics in the vocational training of students in the humanities of pedagogical HEUs // Scientific activity as a way of forming professional competencies of a future specialist: Matem. Scientific-Practical Conf. 36.