METHODS OF USING ARTIFICIAL INTELLIGENCE CAPABILITIES IN TEACHING THE SUBJECT OF ALGEBRA AND FUNDAMENTALS OF ANALYSIS IN ACADEMIC LYCEUMS

F.T. Kholiqulov

Mathematics teacher at the Academic Lyceum of the Mirzo Ulugbek Samarkand State University of Architecture and Civil Engineering. J. Jurayev Street 65, Samarkand, Uzbekistan

ABSTRACT

This article presents information about the advantages of Artificial Intelligence capabilities integrated into the digital education platform "algebraonline.uz" in teaching Algebra and analysis exercises in academic lyceums, in particular, the convenience of a system for assessing the level of student mastery of the subject without the human factor and teacher participation.

KEYWORDS: ChatGPT API, integration, Laravel, Queue technology, platform, e-learning, software tool.

INTRODUCTION

The strategic decisions of the President of the Republic of Uzbekistan aimed at developing the education system are also accelerating the process of digital transformation in our country. In particular, the "Concept for the Development of the Education System in 2020-2025" dated December 24, 2019 states: "It is necessary to improve the quality of education, improve the level of knowledge of students, and develop innovative thinking through the widespread introduction of information and communication technologies."

By integrating the capabilities of artificial intelligence into the "algebraonline.uz" platform, its main advantage has emerged - automatic analysis of texts via the ChatGPT API. The control work sent by the student is sent to the ChatGPT API, which performs a deep semantic analysis of this text. The ChatGPT API evaluates the sequence of thoughts in the text, its relevance to the topic, grammatical correctness, and writing style. As a result, the user is provided with not only a score, but also detailed analysis and suggestions. This greatly helps the student to work on himself, improve his written literacy. Unlike ordinary automated tests, this approach is closer to human thinking and is based on individual assessment.

To ensure more efficient operation of the system, Laravel's Queue system has been implemented. Queue technology separates heavy and time-consuming processes - for example, working with the ChatGPT API, sending texts and waiting for results - from the main user flow and performs them in the background by queuing them. This allows long processes to be executed in the

background without slowing down the user interface. Queues play an important role in making the system fast, stable and user-friendly.

The digital educational platform "algebraonline.uz" is a digital educational platform for 1st-year students of academic lyceums, which includes all 72 hours of theoretical (lectures) and 144 hours of practical classes included in the curriculum for the subject of Algebra and fundamentals of analysis, a total of 216 hours of the subject.

When the user (student) enters the program, the following "User Window" is created. Through this window (desktop), the user first masters theoretical and then practical exercises in the sequence of sections in the subject of Algebra and Fundamentals of Analysis. After fully studying 1 theoretical and 2 practical exercises, the student completes the test tasks given in the "Current Control Submission" item on these topics. After completing the tasks, the "Submit" button provides the result of mastering this topic and the answer (solution) to the questions that were incorrectly answered from the given test tasks. The ability to analyze the solution given by artificial intelligence has been created (see Figure 1).
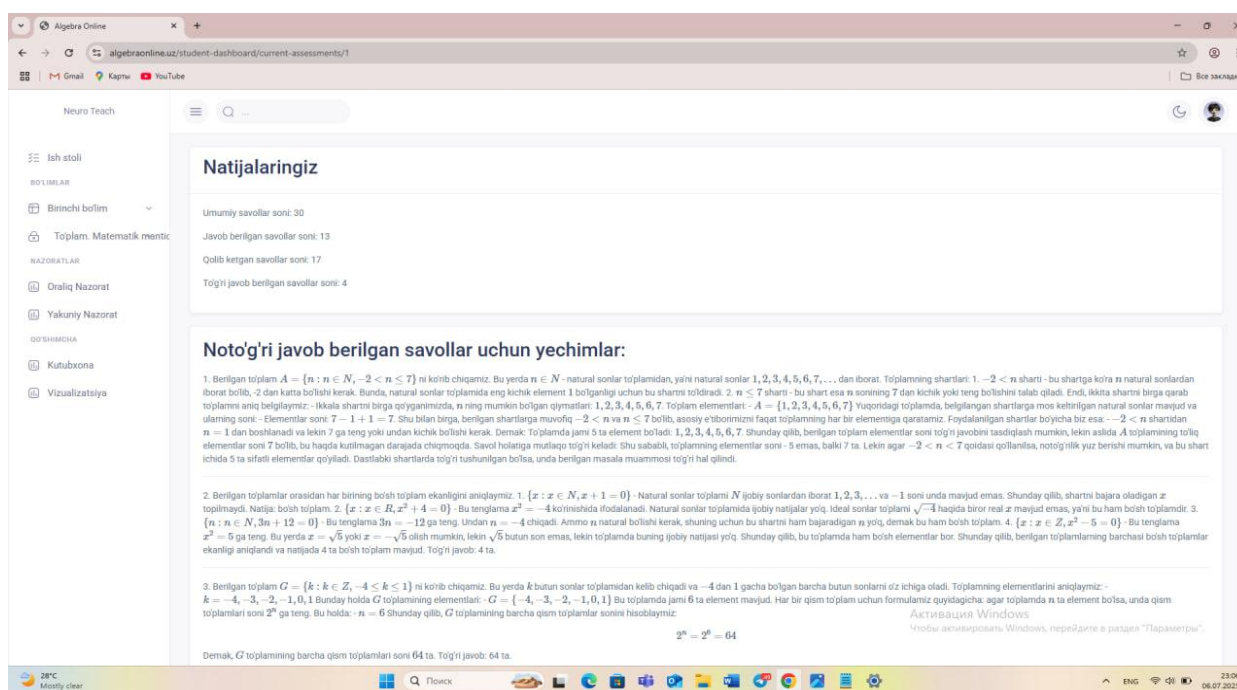

Figure 1. Test question analysis window

This digital educational platform has created 36 Current Controls (CC), 6 Intermediate Controls (IC) and 2 Final Controls (FC) for 72 hours of theoretical classes in the subject of Algebra and Analysis for 1st year students of academic lyceums. The student completes IC after each lecture and 2 practical classes, CC after each section, and FC at the end of each semester. The number of control questions and the time allocated to them may vary depending on the number of topics and the information provided in them.

When passing all types of controls, the student can try these test questions not in one attempt, but several times. The student has the opportunity to complete this process at a convenient time, based on the given time and number of attempts.

In general, the "algebraonline.uz" e-learning platform provides an opportunity for any user to independently master the basics of Algebra and analysis at any time and place, using the most modern methods, completely free of charge.

REFERENCES

1. lex.uz - National database of legislative documents of the Republic of Uzbekistan.
2. M.Dzhabbarov, F.Kholikulov "Fundamentals of algebra and analysis I", Textbook. Samarkand, "Turon Publishing House"-2025.
3. "algebraonline.uz" electronic learning platform. (Ministry of Justice of the Republic of Uzbekistan. Certificate number DGU №53924, 25.07.2025).