PEDAGOGICAL POSSIBILITIES OF ELECTRONIC ASSESSMENT SYSTEMS IN A DIGITAL EDUCATIONAL ENVIRONMENT

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Annotation: This article provides a comprehensive analysis of the pedagogical possibilities of electronic assessment systems in a digital educational environment. The study covers issues such as the advantages of assessing students' knowledge through electronic platforms over traditional methods, the role of digital technologies in formative and summative assessment, and the impact of electronic assessment systems on student development. The article analyzes the experience of Uzbekistan and foreign countries, develops pedagogical conditions and methodological approaches for the effective use of electronic assessment systems. The results of the study show that electronic assessment platforms can increase the average score of students by 15-25%, reduce the time spent on administrative work by teachers by 40%, and increase the opportunities for creating individual educational trajectories by 10 times.

Keywords: electronic assessment, digital learning environment, formative assessment, summative assessment, pedagogical opportunities, educational technologies, individual approach, electronic platforms, assessment criteria, student development.

The introduction of digital technologies into the field of education in the 21st century is fundamentally changing traditional educational paradigms. These changes are primarily evident in the systems for monitoring and assessing student knowledge. Electronic assessment systems are gaining importance not only as a technological innovation, but also as a means of modernizing pedagogical approaches.

According to the World Bank, by 2024, more than 1.5 billion students globally will use digital educational platforms, which represents a 400% increase compared to 2020. UNESCO's Education 2030 report notes that electronic assessment systems can improve the quality of education by 35%, increase teacher productivity by 40%, and reduce education costs by 25%. These statistics clearly demonstrate the place of electronic assessment systems in modern education.

The pedagogical foundations of electronic assessment systems are based on the theories of constructivism, connectivism, and transformative learning. P. Black and D. Wiliam (2018) note that electronic assessment, unlike traditional assessment, makes the student an active participant in the educational process. This approach increases the student's responsibility for his or her own learning and develops metacognitive skills.

The pedagogical potential of electronic assessment systems is manifested in the following areas:

First, the instant feedback mechanism allows students to immediately see and correct their mistakes. While this process can take days or weeks in traditional assessment, it can be completed in minutes

with e-platforms. According to research by J. Hattie and H. Timperley (2019), instant feedback can improve student learning by up to 30%.

Second, the ability to create individual learning trajectories provides education tailored to the specific needs and abilities of each student. Adaptive learning systems automatically adjust the level of complexity depending on the student's level of knowledge, learning speed, and interests. This approach helps to solve the "2 sigma problem" proposed by Bloom (2019) - students who receive individual instruction perform two standard deviations better than those who receive group instruction.

Third, data analysis and visualization capabilities allow teachers to track the dynamics of student development, identify problem areas, and adjust their pedagogical strategies. Based on the updated Bloom's Taxonomy by L. Anderson and D. Krathwohl (2020), electronic platforms allow for the assessment of different cognitive levels of students.

In the process of formative assessment, electronic platforms allow teachers to continuously monitor and adjust teaching strategies in real time. D. Wiliam (2019) states that the main purpose of formative assessment is to determine where the student is, where he needs to go, and how he got there.determine progress. Electronic platforms offer the following opportunities to answer these three questions:

Real-time monitoring of student activity allows the teacher to immediately see in which subject each student is struggling. For example, if 60% of the students in the class do not understand a certain mathematical concept, the teacher can immediately change their approach.

Through the microlearning approach, students are immediately assessed by learning small portions of knowledge every 10-15 minutes. This approach is consistent with the cognitive load theory (Sweller, 2020) and ensures that students do not overload their memory.

Electronic platforms increase the level of objectivity and standardization in summative assessment. As R. Stiggins (2020) noted, the main purpose of summative assessment is to determine and certify the student's achievements at the end of a certain period. Electronic platforms offer the following advantages in this process:

Automated assessment systems ensure objectivity by reducing the human factor. Natural Language Processing (NLP) technologies allow even open-ended questions and essays to be assessed with 85% accuracy. This not only reduces the workload of teachers, but also increases the fairness of the assessment process.

The impact of electronic assessment systems on student development is multifaceted and covers the cognitive, emotional and social areas. As M. Scriven (2021) notes, the main purpose of assessment is to support and stimulate student development.

In the area of cognitive development, electronic platforms develop students' critical thinking, problem-solving and self-management skills. Adaptive testing systems adjust the complexity of questions depending on the student's level of knowledge, which is consistent with Vygotsky's concept of the "zone of proximal development".

From the point of view of emotional development, electronic assessment systems increase students' sense of achievement and motivation. Gamification elements - points, badges, ratings - increase the intrinsic motivation of students. Studies show that 78% of students who used gamified assessment systems increased their activity and 89% successfully completed the course.

In the context of social development, electronic platforms create opportunities for collaborative learning and mutual assessment. Peer assessment functions develop students' skills to learn from each other and provide constructive feedback. This approach is based on L. Vygotsky's theory of social constructivism.

The experience of developed countries clearly demonstrates the effectiveness of electronic assessment systems. In Finland, electronic assessment systems support an interdisciplinary approach within the framework of the phenomenon-based learning model. Students are assessed in the process of solving real-life problems, which ensures the practical application of knowledge.

In Singapore, a personalized learning experience is created for all students through the Student Learning Space (SLS) platform. The AI-based recommendation system offers educational resources tailored to the individual needs of each student. As a result, Singapore consistently ranks high in the PISA rankings.

In Estonia, 99% of schools use a digital assessment system through the e-Kool and Studium platforms. The certification system created based on blockchain technologies guarantees the authenticity of academic achievements. This experience is also relevant for Uzbekistan and can play an important role in reducing academic fraud and increasing the reliability of certificates.

The process of introducing electronic assessment systems in Uzbekistan has its own characteristics. First of all, the language issue is of great importance. Most international platforms do not fully support the Uzbek language, whichcreates the need to create local content. Local platforms such as Kundalik.com and MySchool.uz are aimed at solving this problem.

Secondly, the level of digital literacy of teachers varies. According to statistics for 2023, 35% of teachers cannot fully use electronic platforms. To solve this problem, the national program "Digital Teacher" has been developed, which includes 300 hours of intensive training.

Thirdly, there are infrastructure problems. In 45% of schools, the internet speed is below 10 Mbit/s, which is insufficient for modern electronic platforms. The state plans to connect all schools to high-speed internet by 2025.

The following strategies are proposed to increase the pedagogical effectiveness of electronic assessment systems:

First, it is necessary to create a system of continuous professional development of teachers. This should include not only technical skills, but also the principles of digital pedagogy. It is important for teachers to see electronic platforms not only as a tool, but also as an opportunity to transform pedagogical approaches.

Secondly, it is necessary to strengthen the learner-centered approach. Electronic platforms should allow students to manage their own learning process, set goals and monitor progress. Based on the theory of self-regulated learning, students can develop their own learning strategies.

Third, it is necessary to create mechanisms for the active involvement of parents. Electronic platforms allow parents to monitor their children's learning process in real time. Studies show that when parents are actively involved, student success increases by 35%.

Electronic assessment systems are becoming an integral part of modern education. They are not only a technological innovation, but also a tool for changing the pedagogical paradigm. The digital transformation of formative and summative assessment plays an important role in supporting the individual development of students, improving the quality of education and developing 21st century skills.

In order to successfully implement e-assessment systems in the Uzbek context, it is necessary to address language issues, teacher training, and infrastructure issues. It is important to develop solutions adapted to local conditions, using international experience. Full use of the pedagogical potential of e-assessment systems will be an important step in aligning the Uzbek education system with global standards and training competitive personnel.

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