PROBLEMS AND SOLUTIONS OF IMPLEMENTING ELECTRONIC PLATFORMS IN SCHOOLS OF UZBEKISTAN

Kholmatov Shohzod Ikromjon ugli

Bukhara Innovation University

Master of Information Technologies in Education

Annotation: The article provides a comprehensive analysis of the main problems arising in the process of introducing electronic education platforms in schools of Uzbekistan and their solutions. The study covers issues of technical infrastructure, personnel training, content quality, security and integration. Based on statistical data for 2023, problems such as the fact that in 45% of schools the Internet speed is below 10 Mbit/s, 35% of teachers cannot fully use electronic platforms, and 30% of quality content in the Uzbek language are identified. The article proposes solutions such as public-private partnerships, the "Digital Teacher" program, the creation of national content centers, the integration of cloud technologies and AI. The results of the study show that by 2025, it is possible to connect all schools to high-speed Internet, certify 500,000 teachers, and create 80% of content in the Uzbek language.

Keywords: electronic platforms, digital transformation, education in Uzbekistan, technical infrastructure, digital literacy, content localization, electronic magazine, teacher training, cloud technologies, digitalization of education.

The introduction of electronic platforms occupies a special place in the framework of the reforms implemented in the education system of Uzbekistan in recent years. The Resolution of the President of the Republic of Uzbekistan No. PQ-4887 “On measures for the further development of digital education” dated November 6, 2020 and the “Digital Uzbekistan – 2030” strategy set ambitious goals for the digitalization of the education system.

Significant achievements have been made within the framework of state programs: the number of schools connected to the Internet increased from 3,847 (39%) in 2020 to 9,445 (95%) in 2023, the number of schools using the electronic journal system increased from 12.5% to 91.9%. The Kundalik.com platform serves 4.2 million students in 7,234 schools. However, behind these figures lie serious problems and tasks that require their solution.

The main obstacle to the implementation of electronic platforms in Uzbek schools is the insufficient development of technical infrastructure. The results of the study identified the following problems:

The issue of the quality and stability of Internet connection is the most pressing problem. In 45% of schools, the Internet speed is below 10 Mbps, which is significantly lower than the minimum requirement for modern electronic platforms (25 Mbps). The situation is especially complicated in rural schools - 68% of rural schools do not have a stable Internet connection. This situation limits the possibilities of conducting video lessons, using multimedia content and real-time assessment.

Unstable power supply is observed in 38% of schools. Power outages not only disrupt the teaching process, but also lead to the failure of servers and computers. This problem is especially acute in remote areas - an average of 3-4 hours of power outages are observed per day.

The student-computer ratio in terms of computer provision is 12:1, which is more than twice the international standard (5:1). In 67% of schools, servers are outdated or do not exist at all, which creates serious problems in storing and processing data. Wi-Fi coverage is fully provided in only 23% of schools, which limits the use of mobile devices.

An integrated approach is needed to solve these problems. First, it is necessary to expand fiber-optic networks through a public-private partnership mechanism. According to estimates, an investment of 1.2 trillion soums will be required to connect all schools to fiber-optic Internet, 60% of which can be provided by the private sector.

Secondly, the use of alternative energy sources will help solve the problem of electricity supply. The project of installing solar panels in 500 pilot schools is showing successful results - power outages have decreased by 90%.

Thirdly, it is necessary to implement the “One Student - One Device” program in stages. In the first stage (2024-2025), students of grades 10-11,in the second stage (2026-2027), it is planned to provide students in grades 5-9 with tablets or laptops, and in the third stage (2028-2030) to primary school students.

The level of digital competence of teachers is a decisive factor in the effective use of electronic platforms. According to the results of the “Digital Readiness of Teachers” survey conducted in 2023 with the participation of 82,450 teachers:

Beginner level: 28% (only computer basics) Intermediate level: 45% (office programs and the Internet) Advanced level: 22% (multimedia and platforms) Expert level: 5% (programming and advanced technologies)

Analysis by age group shows that the level of digital literacy among teachers over 50 is only 21%. This indicates the existence of an age-related digital divide. In addition, 28% of teachers show psychological resistance to new technologies.

To solve the problem of staff training, the national program “Digital Teacher” has been developed. The program consists of three modules:

The main module (80 hours) is mandatory for all teachers and includes computer basics, internet security, electronic platforms, multimedia tools and assessment systems. By 2023, 285,000 teachers (57%) have successfully completed this module.

The specialized module (120 hours) provides in-depth knowledge: digital resources in the subject, online teaching methodology, content creation and project-based learning. 156,000 teachers (31%) have completed this module.

The internship module (100 hours) allows you to gain real experience: a mentoring program, conducting real lessons, creating a portfolio and certification. 98,000 teachers (20%) have completed the internship.

The motivation system also plays an important role. Teachers who receive a digital competency certificate receive a 20% bonus to their monthly salary, and for advanced users this figure reaches 30%. The annual reward system rewards the most active teachers in the amount of 3-5 monthly salaries.

The lack of quality educational content in the Uzbek language does not meet the localization needs of the national education system. Only 30% of existing electronic resources are in Uzbek, 50% in Russian, and 20% in English. These statistics indicate that serious efforts are needed to fully ensure the right to education in the native language.

There are also problems with the quality of content. Most materials are simple PDF versions of traditional textbooks, lacking interactivity and multimedia elements. According to research, only 15% of existing content has interactive features.

To solve these problems, National Content Production Centers are being established. The first center opened in Tashkent in March 2024 and operates in the following areas:

The video studio has a capacity to produce 5,000 high-quality video lessons per year. It is equipped with a professional sound recording studio, chroma-key backgrounds and 4K video editing equipment. By June 2024, 1,200 video lessons had been created.

The animation department creates 3D and 2D animations, infographics and visual materials. 15 professional animators and designers work. An average of 100 animated videos are produced per month.

The interactive content laboratory creates interactive exercises, simulations and games based on HTML5, JavaScript and other modern technologies. In the first quarter of 2024, 450 interactive modules were developed.

The translation and localization department translates the best educational resources from international experience into Uzbek and adapts them to the local context. Professional translators and subject specialists work together.

With the widespread use of electronic platforms, cybersecurity issues are becoming increasingly relevant. The number of cyberattacks targeting educational institutions increased by 340% in 2023. The most common threats are:DDoS attacks are especially common during exam periods. In June 2023, the DTM platform was attacked for 72 hours, as a result of which 150,000 applicants were temporarily unable to use the service.

23 schools lost their data as a result of ransomware attacks. The average ransom demand was around $ 150,000. Most worryingly, 78% of schools do not have a backup practice.

42% of phishing campaigns are successful. Teachers and administrators reveal their logins and passwords through fake emails. In 2023, 1,200 teacher accounts were compromised.

A comprehensive security strategy has been developed to address these problems:

Technical protection measures include End-to-end encryption, Multi-factor authentication, DDoS protection systems, Web Application Firewall (WAF) and SIEM (Security Information and Event Management) systems. The annual security budget for each school is set at a minimum of 10 million soums.

Organizational measures include the development of an Information Security Policy, Data Retention Policy, Incident Response Plan, and Business Continuity Plan. Mandatory security awareness training is conducted quarterly.

The 3-2-1 backup rule is used to protect data: 3 copies, 2 different media, 1 offsite backup. Agreements with cloud backup services have been concluded.

Various educational institutions in Uzbekistan use different platforms: Kundalik.com (73%), MySchool.uz (5%), Moodle (1.3%), EduPage (0.9%), etc. The difficulty of exchanging information between these platforms violates the integrity of the educational process.

The lack of API standards prevents effective communication between systems. Each platform uses its own data format, which complicates integration. The lack of integration with state systems (for example, EMIS - Education Management Information System) leads to the need for manual data entry.

The Uzbekistan Education Information Systems Standard (OTATS) is being created to develop unified standards. It includes the following components:

The data format standard defines a unified data exchange format based on JSON and XML. All platforms must switch to this standard by 2025.

The API specification standardizes authentication, authorization, and data exchange protocols based on the principles of RESTful API. The OpenAPI 3.0 specification is used.

The security standard requires the use of OAuth 2.0, JWT tokens, and TLS 1.3 protocols. All API calls must be logged and an audit trail must be created.

Large investments are required for the digitization of education. The 2024 budget allocates 2.3 trillion soums for the digitalization of education, which is 5 times more than in 2020. However, real needs are estimated at around 5-6 trillion soums.

The distribution of financial resources also creates a problem: Infrastructure: 45% (Internet, computers, servers) Software: 20% (licenses, platforms) Personnel training: 15% (trainings, salaries) Content creation: 10% (studios, specialists) Security: 5% (security systems) Other expenses: 5%

Bureaucratic obstacles also create a significant problem. It takes an average of 3-4 months to purchase new technologies. Due to the complexity of the tender processes, many schools cannot use modern technologies in a timely manner.

To solve the above problems, the National Strategy "Digital School" for 2024-2030 has been developed. The strategy includes the following areas:

Infrastructure development: by 2025, all schools will be connected to fiber-optic internet, and by 2027, the student-computer ratio will be increased to 5:1It is planned to deliver, install interactive panels in all classrooms by 2030.

Regarding personnel training, it is planned to digitally certify 500,000 teachers by 2025, open the “Digital Pedagogy” direction in all pedagogical universities by 2027, and create a continuous professional development system by 2030.

Regarding content creation, it is planned to create 80% of content in Uzbek by 2025, form a database of interactive resources in all subjects by 2027, and introduce an AI-based adaptive content creation system by 2030.

International cooperation plays an important role in the process of digitizing the education system of Uzbekistan. The following projects are currently being implemented:

The Smart Education project in partnership with South Korea involves equipping 100 pilot schools with modern technologies and training 1,000 teachers based on Korean experience. By April 2024, 25 schools will be fully equipped.

The e-School Uzbekistan project with Estonia includes improving electronic journal systems, introducing a blockchain-based certification system, and exchanging experience in cybersecurity.

With China, the Digital Silk Road – Education project plans to use 5G technologies in education, create AI-based educational platforms, and introduce Big Data analytics systems.

As a result of the successful implementation of electronic platforms, the following indicators are expected to be achieved by 2030:

In terms of education quality indicators, PISA scores are projected to increase from 420 to 520, TIMSS results are projected to improve by 30%, and university admission rates are projected to increase from 65% to 85%.

In terms of economic impact, the contribution of the education sector to GDP is expected to increase from 2.5% to 4.5%, 500,000 new jobs in the IT sector are expected to be created, and IT exports are expected to reach $2 billion.

In terms of social impact, it is planned that the digital literacy rate will reach 99%, the urban-rural education quality gap will decrease to 10%, and the gender parity coefficient will reach 0.95.

Although the process of introducing electronic platforms in Uzbek schools is fraught with complex problems, these problems can be solved through a clear strategy and consistent efforts. It is necessary to comprehensively address the issues of technical infrastructure, personnel training, content quality, security and integration.

The measures implemented within the framework of the national strategy "Digital School" will allow transforming the Uzbek education system into a modern, efficient and competitive system. International cooperation, innovative solutions and the active participation of all stakeholders will ensure the successful implementation of this process.

The introduction of electronic platforms is not only a technological modernization, but also a means of changing the educational paradigm, strengthening the student-centered approach and developing 21st century skills. The digital transformation of the Uzbek education system will be an important step in the overall development of the country and increasing its competitiveness in the international arena.

List of used literature

1. Resolution of the President of the Republic of Uzbekistan dated November 6, 2020 No. PQ-4887 “On measures for the further development of digital education”.

2. Strategy “Digital Uzbekistan – 2030”. Decree of the President of the Republic of Uzbekistan dated October 5, 2020 No. PF-6079.

3. Begimkulov, U.Sh. (2021). Development of professional competence of future teachers in the context of informatization of education. Tashkent: Science and Technology.

4. Muslimov, N.A., & Usmonboyeva, M.H. (2020). Pedagogical technologies and pedagogical skills. Tashkent: Sano-standart.

5. Abdukodirov, A.A., & Pardayev, A.X. (2019). Theory and practice of distance learning. Tashkent: Fan.

6.Lutfillaev, M.H. (2022). Improving assessment systems in an electronic learning environment. Journal of Continuous Education, 3, 45-52.

7.Mardanov, A.M. (2021). Integration of digital technologies into the educational process. Pedagogical Education, 4, 23-29.

8.Ministry of Public Education of the Republic of Uzbekistan. (2023). Statistical report on the digitalization of education. Tashkent: XTV.

9.World Bank. (2023). Digital Technologies in Education: Global Trends and Perspectives. Washington: World Bank Group.

10.UNESCO. (2024). Education 2030: Digital Transformation in Education. Paris: UNESCO Publishing.

11.OECD. (2023). Digital Education Outlook 2023: Trends and Policy Priorities. Paris: OECD Publishing.

12.Kundalik.com. (2023). Electronic journal platform statistical report. Tashkent: Kundalik LLC.