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METHODOLOGICAL FOUNDATIONS AND PEDAGOGICAL TECHNOLOGIES OF DISTANCE TEACHING IN UNIVERSITIES

Kunnazarov Aliy Bisenbayevich (1,2)
1 Assistant of the Berdakh Karakalpak State University,
2 Independent researcher of the Ajiniyaz Nukus State Pedagogical Institute

Abstract
The article analyzes the methodological foundations and pedagogical technologies of distance learning (DL) in higher educational institutions (HEIs). Issues of didactic principles, design of educational content, organization of the educational process, and assessment of student mastery based on the combination of modern information and communication technologies (ICT) and pedagogical methods are considered. Ways to improve the quality of education, develop students' independent learning skills, and accelerate the digital transformation of higher education institutions through the effective use of pedagogical technologies are proposed.

Keywords: Distance learning, methodology, pedagogical technologies, ICT, didactics, quality of education, independent learning, digital transformation, higher education.

Introduction

The methodology of distance learning in universities is based on the integration of the principles of openness, accessibility, interactivity, individualization, modularity and flexibility. These principles reflect the strategic guidelines of modern education and ensure the transition to a student-centered learning model. In the context of digitalization of the educational environment, the main focus is shifting from passive acquisition of knowledge to the development of active cognitive activity, critical thinking and digital literacy.

The key feature of distance education is the transition from the traditional broadcast model of learning to an interactive one based on cooperation and constant feedback. The student becomes not just an object of learning, but its

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active subject. This methodology is especially important when teaching the discipline "Computer Science", where in addition to theoretical knowledge, it is necessary to practice practical skills: programming, algorithmic thinking, working with databases and information systems.[1].

The modular rating system is a structured approach to organizing the educational process, in which the course is divided into logically complete modules. Each module includes a theoretical block, practical assignments, testing, and self-control elements. The student's knowledge is assessed based on the totality of assignments completed throughout the course, and not just the final exam.

This method provides:

- provides step-by-step control of knowledge and eliminates overload at the end of the semester;
- allows for the development of sustainable learning motivation, as each module is accompanied by assessment and feedback;
- promotes the development of independent planning and self-control skills in students.

Blended learning learning) combines online and traditional forms of teaching. This is a flexible approach in which the student masters part of the material in digital format (video lectures , forums, online tests), and the other part - in the form of face-to-face or synchronous sessions (webinars , face-to-face practices).

Benefits of blended learning :

- allows you to personalize learning, adapting to the pace and preferences of each student;
- promotes in-depth acquisition of knowledge through active interaction in both formats;
- ensures flexibility of the educational process and its accessibility regardless of the student’s location.

The project method is aimed at involving students in solving real or realistic problems. Students work on a project individually or in a group, going through stages from setting a goal to presenting the finished product.

Key effects of the project method:

- development of practice-oriented and interdisciplinary competencies;
- development of teamwork, critical thinking and self-organization skills;

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- integration of theory with practice, which makes knowledge more meaningful and applicable.

In a remote environment, the project method is implemented using cloud storage, collaborative editors (Google Docs , Notion , Trello), video conferencing and presentation platforms.

The case method involves the analysis of specific educational situations based on real or simulated problems. Students are asked to study the case, identify problems, propose solutions and justify their choice.

Advantages of the case method:

- development of analytical and logical thinking;
- stimulation of discussion and research activity;
- development of decision-making skills in conditions of uncertainty.

It is especially effective in economic, legal, management and IT disciplines, where experience in analyzing practical cases is important.

Gamification is the introduction of game elements into the educational process. These can be points, levels, badges , ratings, virtual rewards for completing tasks, passing tests on time, or participating in activities.

Pedagogical goals of gamification :

- student motivation and engagement ;
- formation of a competitive environment that stimulates activity;
- transforming learning into a process with elements of challenge and achievement.

Research shows that gamified courses promote greater retention and increase assignment completion rates.

Interactive visuals are one of the most important components of effective distance learning. They include:

- video tutorials and screencasts ;
- demonstration simulators (for example, physics or programming laboratories);
- interactive diagrams, maps, 3D models;
- virtual laboratories and simulators.

They:

- make learning visual and accessible to visual and kinesthetic learners ;
- promote deep understanding of abstract and complex concepts;
- allow you to safely practice practical skills in a simulated environment.

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A special role is played by the system of constant and multi-channel feedback: this is implemented through online chats, forums, automatic testing systems and individual consultations in a video conference environment. Thanks to this, it is possible to quickly respond to difficulties in learning, adjust individual trajectories and strengthen the person-oriented approach[2].

Research by scientists of Uzbekistan

Modern approaches to the methodology and technologies of distance learning in Uzbekistan are formed on the basis of numerous applied and theoretical studies conducted by domestic specialists in the field of pedagogy, information technology and educational psychology. The most significant studies that have influenced the development of this area are presented below.

Doctor of Physical and Mathematical Sciences T.Zh. Abdurasulov , professor at the Tashkent State Technical University, in a number of his works substantiates the need to move to a conceptually new model of teaching ICT disciplines in a distance learning format. In particular, he proposes using the reverse engineering methodology (backward design), in which the educational process is built from pre-formulated goals and results to the selection of content and technologies. In his opinion, such a course structure ensures the integrity of knowledge, structures it around key concepts and ensures alignment between goals, teaching methods and assessment. The scientist emphasizes the need for widespread implementation of modular and interactive learning formats, in which the student can independently choose the trajectory of the course, based on his interests and level of training.

Doctor of Pedagogical Sciences F.N. Mamatkulov , professor at Fergana State University, conducted a comprehensive study of the effectiveness of the implementation of LMS platforms Moodle and Edmodo in the educational process of universities in the Fergana and Bukhara regions. He noted that the combination of the LMS environment with elements of visual programming (for example, the use of platforms such as Scratch , Code.org and AppInventor) provides a steady increase in the indicators of mastering the material. His experiments involved 160 students, among whom an experimental and control group were created. The results demonstrated that students who studied using a mixed model using visual programming showed 18% higher results in the final testing compared to the group studying using the traditional method.

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Doctor of Technical Sciences H.Yu. Yuldashev, professor at the Tashkent University of Information Technologies named after Muhammad al- Khwarizmi , devoted his research to the application of gamification approaches in the process of teaching programming in a distance form. His research covered such elements of gamification as a system of cumulative points, achievements, virtual awards, individual development trajectories. Based on experiments conducted with 1st-2nd year students of ICT specialties, it was found that the introduction of game elements in the process of studying the discipline "Fundamentals of Algorithmization and Programming" contributed to an increase in course attendance by 23%, and also significantly increased student activity on forums and in discussions. The use of leaderboards (rating system) and a bonus system for independent completion of additional tasks turned out to be especially effective.

Under the supervision of Professor M. Kadyrov, research in the field of personalized e-learning was conducted at the Namangan Engineering and Pedagogical Institute. Scientists developed e-courses that take into account individual styles of information perception (visual, auditory, kinesthetic), as well as the pace of material acquisition by each student. Artificial intelligence technologies and digital trace analysis (log files, activity history, content preferences) were used to build such courses. This made it possible to create adaptive learning paths within the course "Information Technologies in Education". A comparative analysis showed that when using adaptive courses, the average final score of students increased by 0.9 points on a 5-point scale, and the number of omissions and unlearned topics decreased.

In addition, in scientific publications such as " Ta'lim va innovatsiyalar ", " Pedagogika va psixologiya ", the problem of digital transformation of the university and the role of the teacher in this process is systematically raised. The authors emphasize that the transition to distance learning requires not only technical re-equipment of the educational process, but also high-quality training of the teaching staff.

Particular attention is paid to the need to organize advanced training programs aimed at mastering the tools of digital pedagogy, psychology of online interaction and methods of working with LMS systems. Otherwise, according to the researchers, no innovative methodology will bring the desired result due to the low readiness of teachers to use new formats[3].

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If all the above conditions are met, based on the fundamental rules that have been given, we can consider the function of creating virtual meetings for conducting online lessons on the UZOOM platform . Figure 1 shows the sequence of creating a virtual class. Figure 2 shows the sequence of entering a virtual lesson on the platform.

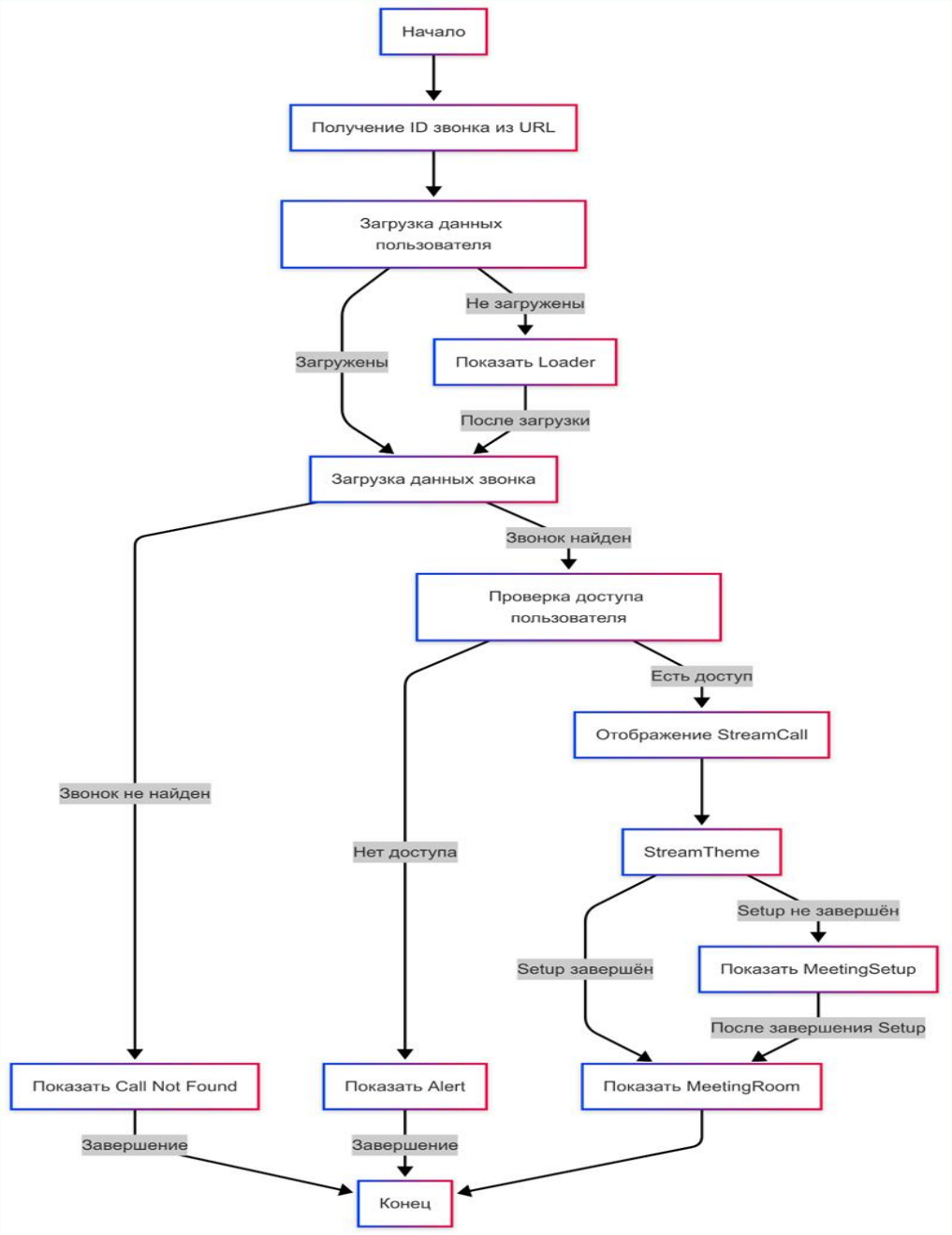

Fig. 1. Sequence of creating a virtual class.

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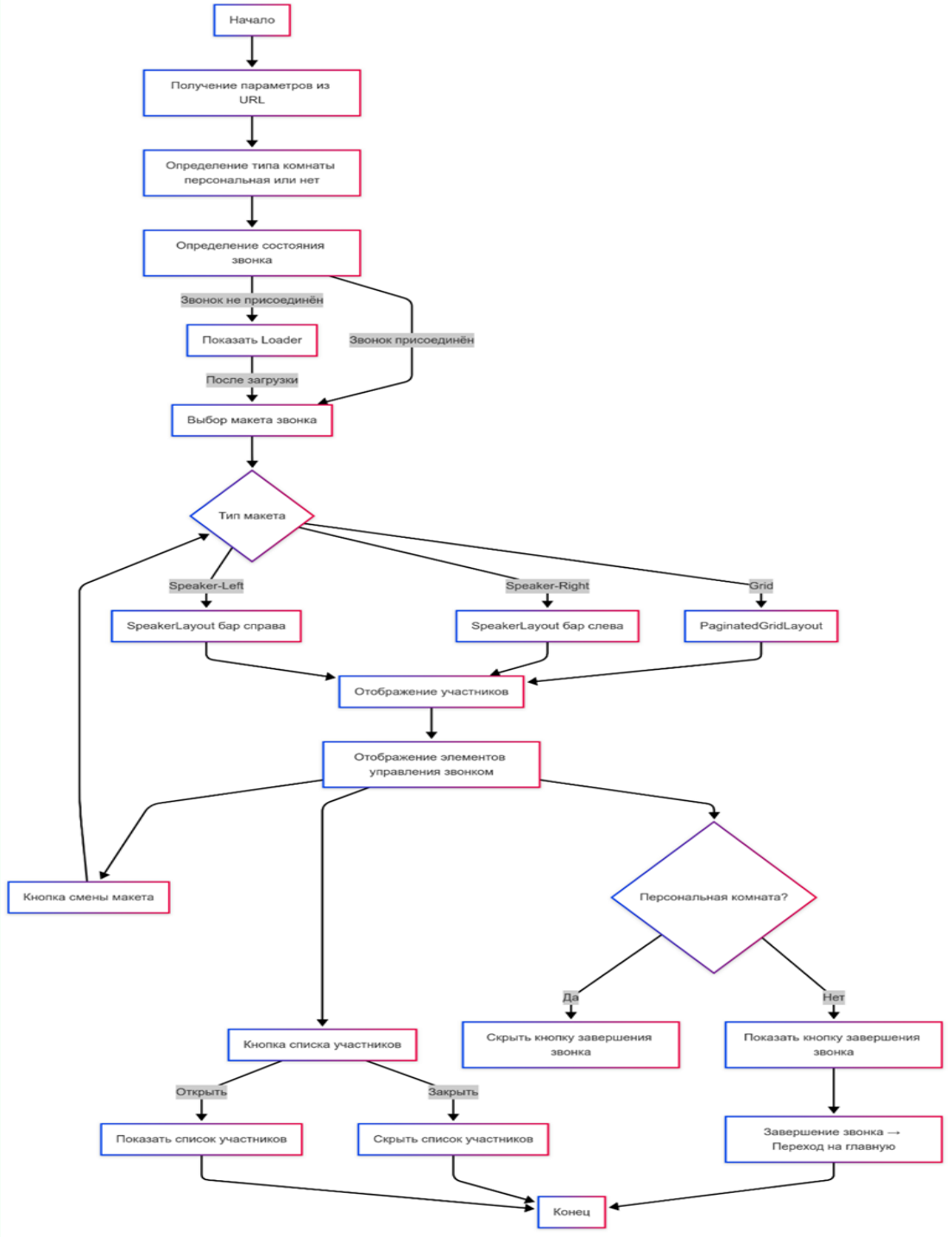

Fig. 2. Sequence of entering a virtual lesson on the platform.

Conclusion

Methodological foundations and pedagogical technologies of distance learning in higher educational institutions provide an opportunity to improve the quality of education, develop students' independent learning skills, and accelerate the digital

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transformation of higher education institutions. Based on didactic principles in teaching, the effective use of pedagogical technologies and the correct application of ICT tools contribute to the effective organization of the educational process and ensuring students' assimilation.

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