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Pedagogical software tools as a methodological basis for improving the acting competence of teachers

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Abstract: This article examines pedagogical software tools as a methodological basis for developing teachers' ICT competencies. It provides a scientific analysis of the processes of digital transformation in education and the possibilities of innovative pedagogical technologies.
Key words: pedagogical software tools, ICT competence, digital transformation, innovative technologies, methodological framework, educational effectiveness, professional skills.

Introduction. The current fundamental changes in education, in particular, the widespread use of digital technologies, are raising the quality of this system to a higher level. The development of information and communication technologies is having an impact on the form, methods and content of the education system. Electronic textbooks, interactive presentations, distance learning platforms (Zoom, Moodle, Google Classroom, etc.) and educational programs based on artificial intelligence make the learning process more effective, interesting and personalized. This, in turn, strengthens students' independent thinking, self-management and develops their creative research.

Pedagogical software tools in the educational process— Learning Management System (LMS), multimedia platforms, simulation systems, interactive testing environments are widely used. However, to effectively use these tools, a teacher must have not only technical knowledge, but also comprehensive ICT competence. This competence combines technical, methodological and communicative skills.
The main problem is that many teachers are unable to fully and effectively use existing pedagogical software tools. One of the main reasons for this is the lack of specialized professional training and the conflict between traditional teaching methodologies and the modern digital environment.

Main Part
Pedagogical software tools- is a set of programs designed to support, manage, and develop the learning and teaching process. These tools not only facilitate knowledge exchange, but also ensure effective interaction between students and teachers, and monitor results in real time.

Modern pedagogical software tools are functionally divided into the following types:
Table 1. Types and functions of pedagogical software tools

	You have	Examples	Role in education
1	Learning Management Systems (LMS)	Moodle, Google Classroom, Canvas	Course management, assignment and assessment
2	Multimedia educational tools	Camtasia, Articulate Storyline, iSpring	Creating video tutorials, animations, and interactive content

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3	Simulation and virtual laboratories	PhET, Labster, Odysseyware	Conduct experiments safely in a virtual environment
4	Online testing and assessment systems	Kahoot, Quizlet, Google Forms	Organizing formative and summative assessment
5	Collaboration platforms	Microsoft Teams, Slack, Padlet	Group projects, discussions, and team presentations
6	Digital library and resources	JSTOR, Ziyonet, Khan Academy	Access to scientific and educational materials

Structural model of ICT competence for teachers

ICT competence is the ability to effectively and creatively use information and communication technologies in professional activities. This competence consists of several components, which are interrelated and complementary.

The TPACK (Technological Pedagogical Content Knowledge) model, developed by researchers Mishra and Koehler, clearly defines the knowledge and skills required by a teacher to use pedagogical software tools. This model assumes a holistic competence that is formed by the intersection of three main components: technological knowledge, pedagogical knowledge, and content knowledge. In general, teachers' ICT competence should cover the following eight areas:

1. Technical literacy - skills in working with devices and programs;
2. Digital content creation - development and editing of electronic materials;
3. Information and media literacy - searching for and critically evaluating online information;
4. Security and ethics - cybersecurity, personal data protection;
5. Communication and collaboration - effective communication on digital platforms;
6. Problem solving - independent resolution of technological problems;
7. Pedagogical integration - the didactically correct application of ICT in the lesson;
8. Constant self-development - a desire to learn new technologies.

The role of pedagogical software in improving ICT competence

Pedagogical software tools have an impact on increasing teachers' ICT competence in two ways: first, the teacher strengthens his technical skills by using these tools; second, his methodological competence develops as a result of effectively organizing the educational process with the help of these tools.

Competency development through LMS platforms

Learning Management System (LMS) is the most common pedagogical software tool in modern educational institutions. LMS platforms such as Moodle, Google Classroom, Canvas provide teachers with the following capabilities:

-Structuring courses and systematically organizing content;
-Monitoring students' learning levels in real time;
-Automated assessment and instant feedback;

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-Group and individual project management;
-Organizing online discussions and collaborative learning.
Multimedia and interactive tools: are effective teaching mechanisms. Multimedia educational tools - digital content that combines video, audio, animation and interactive elements - fundamentally change the methodology of teacher preparation. Through programs such as Camtasia, Articulate Storyline, Adobe Captivate, the teacher does not just lecture to a passive audience, but creates an active learning environment.
In the process of preparing and using these tools, the teacher's ICT competence develops significantly, as he or she simultaneously acts as a scriptwriter, director, and technical specialist.

Virtual labs and simulation technologies

In modern education, the use of interactive platforms such as the PhET Interactive Simulations project of the University of Colorado is important in developing teachers' ICT competencies. This system provides interactivity between students and teachers through the visualization of specific subjects. "Working with these tools for the teacher develops the following ICT competencies: the ability to select digital resources according to pedagogical goals, the ability to design interactive environments didactically, and the skills to manage students' activities in a digital environment.

A model for developing teachers' ICT competence

Summarizing modern pedagogical research and existing experiences, it is advisable to implement the following four-stage model for developing teachers' ICT competence through pedagogical software tools:
Stage 1: Diagnostics and motivation At this stage, the teacher's level of digital literacy is determined, positive motivation towards the use of modern technologies is instilled, and a personal development plan is created.
Stage 2: Theoretical and methodological preparation. Educators are trained to work with LMS (e.g. Moodle, Google Classroom), interactive multimedia tools, and online assessment systems. At this stage, theoretical knowledge is integrated with practical exercises.
Phase 3: Implementation and Integration. The teacher begins to directly use digital technologies in teaching his subject. In this case, lessons are enriched with simulations (for example, PhET), video lessons, and interactive tasks.
Stage 4: Monitoring and professional development The results achieved are analyzed, the level of ICT competence is assessed based on international and national standards, and a system of continuous self-improvement of the teacher is formed.
This model was developed taking into account the specifics of the national education system, the workload of teachers, and the technical infrastructure of institutions. The flexibility of the model also allows it to be adapted to the needs of any educational institution:

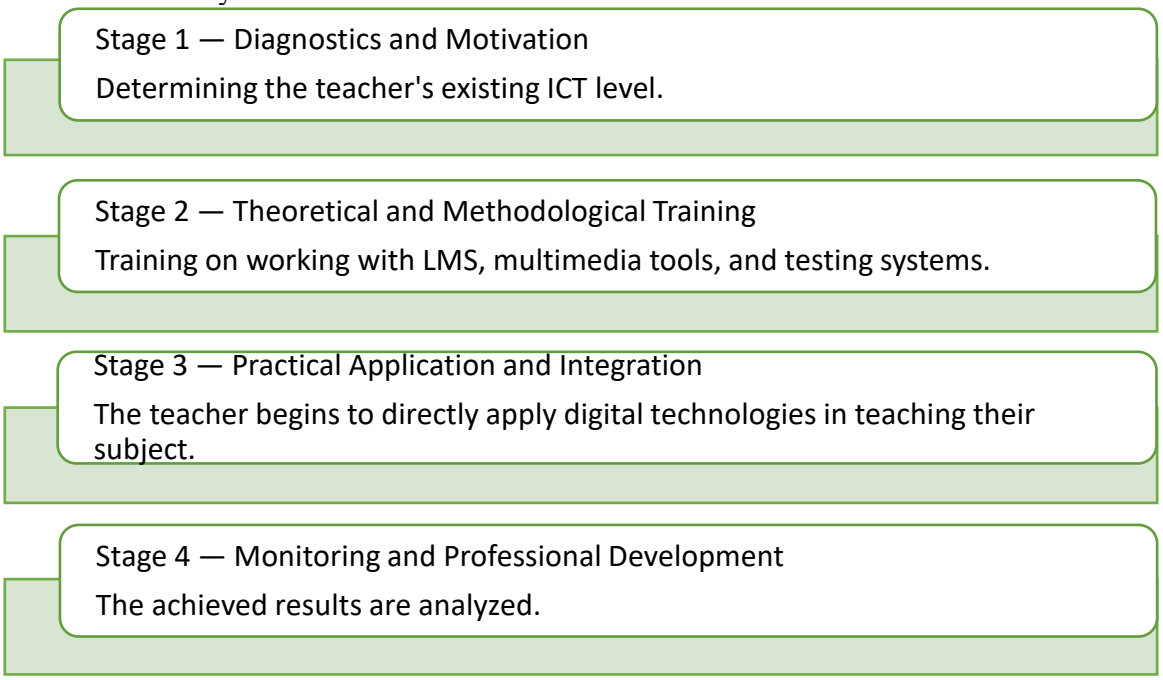

Figure 2.O‘A step-by-step model for improving students' ICT competence

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Results And Discussion

1. First, it has been proven that pedagogical software tools have a direct and indirect impact on improving teachers' ICT competence. Direct impact - the development of teachers' technical skills in the process of working with these tools; indirect impact - updating methodological approaches and increasing pedagogical creativity.
2. Secondly, LMS platforms, multimedia tools, simulation systems and online assessment platforms each have a special role in developing a specific component of ICT competence. These tools are effective when used together.
3. Third, the proposed four-stage model (diagnostics - theoretical and methodological preparation - practical application and integration - monitoring and professional development) provides a practical mechanism that can be used in educational institutions.

Conclusion And Recommendations

1. Pedagogical software tools serve as a methodological basis for improving teachers' ICT competence in modern education. They should be considered not only as a technological opportunity, but also as an effective way of professional development. Based on this study, the following conclusions and recommendations were formulated:
2. Recommendations for teachers:
3. Stay up-to-date and regularly use at least one digital tool in your classroom.
4. The LMS platform should be used not only for sending assignments, but also for active communication and exchange of ideas with students.
5. Sharing experiences with colleagues builds a digital pedagogical community.
6. In conclusion, it is worth noting that pedagogical software tools do not just arm teachers with technological weapons - they expand the teacher's professional consciousness, renew their worldview, and prepare them for the formation of competitive educators in the modern digital world.

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