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ADAPTIVE LEARNING IN THE ELECTRONIC ENVIRONMENT: RESEARCH ON APPLICATION AND EFFECTIVENESS FOR THE DEVELOPMENT OF PROFESSIONAL COMPETENT PEDAGOGUES

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A R T I C L E I N F O.

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Abstract

this article examines the application and effectiveness of adaptive training in an electronic environment for the development of professional competence pedagogues. Education through electronic systems, personalized for individual needs and levels of preparation for each student, will be more popular and popular in modern educational practice.

Introduction: In the modern information society, where technological innovations are constantly transforming educational practices, adaptive education in the electronic environment is a promising direction, capable of developing a professional and competent pedagogue. The approach to training is based on the use of technological, enabling personalization of the educational process and the adaptation to individual needs and abilities[1].

This study aims to study the applicability and effectiveness of adaptive learning in an electronic environment for the development of professional competencies of teachers. The purpose of this study is to identify the factors that determine the successful implementation and use of adaptive educational technologies for teacher training, as well as to assess their impact on the development of professional skills and competencies of teaching staff.

[1] **Орлов, А.Б. (2020). Адаптивное обучение: теоретические основы и практическая реализация. Москва: Издательство “Просвещение”**

To achieve this goal, it is expected to solve the following research problems:

1. Analysis of the theoretical foundations of adaptive learning in an electronic environment: within the framework of this task, it is planned to systematize and generalize modern theoretical ideas about adaptive learning and its capabilities in an electronic environment. This includes the study of pedagogical concepts, models and approaches that underlie adaptive learning, as well as the analysis of modern technological solutions for its implementation.

2. Assessing the experience of using adaptive learning in pedagogical practice: This task involves analyzing and summarizing the experience of using adaptive educational technologies in the pedagogical practice of various educational institutions. This includes examining successful case studies, analyzing barriers and challenges educators face when implementing adaptive learning, and identifying factors that facilitate the effective use of this approach.

3. Determining the effectiveness of adaptive learning for the development of professional competencies of teachers: This task is aimed at assessing the impact of adaptive learning in an electronic environment on the development of professional competencies of teachers. This includes measuring the level of development of professional skills and competencies among teachers who took part in adaptive educational programs, a comparative analysis of their results with the results of training using traditional methods, as well as identifying the characteristics of perception and assimilation of material depending on the use of adaptive technologies.

Conducting this study will expand our understanding of the applicability and effectiveness of adaptive learning in an electronic environment for the development of professional competencies of teachers, as well as identify ways to optimize this approach in teaching practice.

Literature review: History of the development of electronic systems in education.

The history of the development of electronic systems in education is associated with the constant desire of educational institutions to improve the educational process and improve the quality of teaching. This process covers the evolution of information technologies, their integration into educational practices and the gradual formation of the concept of adaptive learning in an electronic environment. Below is an overview of key moments in the history of the development of electronic systems in education.

1. Emergence of Computers in Education: In the 1960s, computers began to be introduced into educational institutions. At that time, they were used mainly to automate administrative processes. However, it quickly became apparent that computers had the potential not only to manage data, but also to enrich the educational process[2].

2. Development of educational software: In the 1970s and 1980s, the first educational programs created specifically for use on computers appeared. These programs allowed students to master the material in an interactive form, which significantly expanded the possibilities of the educational process[3].

3. Internet and online learning: At the end of the 20th and beginning of the 21st century, with the development of the Internet, opportunities for online learning emerged. Distance learning and massive open online course (MOOC) platforms have become accessible to learners around the world. This made it possible to provide access to education to those who were previously unable to obtain it due to geographical or other barriers [1].

4. Personalization of learning and adaptive systems: In modern educational systems, increasing attention is being paid to the personalization of learning. Adaptive education systems use data about a

[2] Johnson, L., Adams, S., & Cummins, M. (2012). The NMC Horizon Report: 2012 Higher Education Edition. Austin, TX: The New Media Consortium

[3] Clark, R. E. (1983). Reconsidering research on learning from media. Review of Educational Research, 53(4), 445-459

student's preferences, learning style, and knowledge level to provide a personalized educational experience. This allows you to use study time more effectively and ensure deeper and longer-term assimilation of the material[4].

The study of the applicability and effectiveness of adaptive learning in an electronic environment for the development of professional competencies of teachers is a logical continuation of this evolutionary process in the field of education. It is aimed at identifying the potential of adaptive systems to improve the quality of training of teaching staff and optimize the process of their professional development.

Research methodology: Determining the target audience of the study.

The target audience of this study is teaching staff at various levels of the educational system, including teachers, lecturers, administrators of educational institutions and other specialists engaged in professional activities in the field of education.

1. Teachers and lecturers: The main target group of the study includes teachers and lecturers at various levels and types of educational institutions, including schools, colleges, universities and other educational organizations. This includes both experienced teachers and new teachers[5].

2. Educational Administrators: Another important target audience includes educational administrators, such as school principals, university deans, educational program directors, and others who make decisions about the use of technology and teaching methods in their institutions[2].

3. Educational Professionals: In addition, the study may be of interest to educational professionals such as educational consultants, academics, curriculum developers and other professionals whose work is related to educational methods and technologies[6].

The target audience of the study covers a wide range of professional competencies and levels of experience in the field of education, which will provide a diverse and informative view of the applicability and effectiveness of adaptive learning in the electronic environment. Including different aspects of the educational process will also allow us to take into account the diverse needs and contexts in which adaptive learning can be used, and offer recommendations aimed at maximizing the satisfaction of these needs.

Innovative approaches to improving teaching methods through an electronic system. Adaptive learning and personalization of the educational process.

Adaptive learning in an electronic environment is an innovative approach to education based on personalizing the educational process in accordance with the individual needs, level of knowledge and preferences of each student. This approach not only improves the accessibility of education, but also significantly increases the effectiveness of learning, adapting it to the individual characteristics of each student[7].

Adaptive learning:

One of the key innovative approaches in the field of adaptive learning is the use of machine learning and artificial intelligence algorithms to analyze training process data. These algorithms can analyze data about a student's performance, responses to questions, time spent on assignments, and more to determine

[4] VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. Educational Psychologist, 46(4), 197-221

[5] Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. The International Review of Research in Open and Distributed Learning, 12(3), 80-97

[6] Garrison, D. R., & Vaughan, N. D. (2008). Blended learning in higher education: Framework, principles, and guidelines. John Wiley & Sons.

[7] Siemens, G., & Baker, R. S. (2012). Learning analytics and educational data mining: towards communication and collaboration. In Proceedings of the 2nd international conference on learning analytics and knowledge (pp. 252-254). ACM.

individual needs and preferences[8].

Personalization of the educational process:

The main advantage of adaptive learning is its ability to personalize the educational process. By analyzing each student's data, an adaptive learning system can provide personalized learning materials, assignments, and teaching methods that best suit their needs and skill level[9].

Adaptive educational platforms:

There are a number of innovative educational platforms specifically designed to implement adaptive learning. These platforms often provide a wide variety of learning materials, interactive assignments, and tests that are automatically tailored to each student's individual needs[10].

Adaptive learning in an electronic environment is an innovative approach that helps improve the effectiveness of education and develop the professional competencies of teachers. Personalization of the educational process with the help of adaptive systems allows you to make the most efficient use of time and resources, providing each student with optimal conditions for learning and development[11].

Development and implementation of innovative teaching methods.

The process of introducing methods into educational institutions.

The introduction of innovative teaching methods based on adaptive learning in an electronic environment into educational institutions requires a systematic and targeted approach. Below are the main stages of the process of implementing such techniques:

1. Preparatory stage:

• Needs analysis: Conducting an analysis of the current state of the educational process and identifying the needs of students and teachers in the context of adaptive learning.

• Study of best practices: Study the experiences of other educational institutions that have successfully implemented adaptive learning and identify best practices.

2. Development of methods and training programs:

• Creation of educational materials: Development of educational materials, assignments and tests taking into account the principles of adaptive learning and the individual needs of students.

• Selecting educational platforms: Selecting or developing educational platforms that support adaptive learning and customizing them to meet curriculum requirements.

3. Testing and adaptation:

• Pilot testing: Conducting pilot testing of developed methods on a limited group of students and teachers to identify and eliminate possible problems and shortcomings.

• Adaptation of methods**: Making adjustments to teaching methods based on feedback from pilot testing participants.

4. Staff training:

• Teacher training: Training teaching staff in new teaching methods, including familiarization with the principles of adaptive learning and the features of using educational platforms [3].

5. Implementation and scaling:

[8] Koedinger, K. R., & Corbett, A. T. (2006). Cognitive tutors: Technology bringing learning science to the classroom. In Handbook of educational psychology (pp. 645-656). Macmillan.

[9] VanLehn, K. (2011). The relative effectiveness of human tutoring, intelligent tutoring systems, and other tutoring systems. Educational Psychologist, 46(4), 197-221.

[10] Mitrovic, A. (2012). Fifteen years of constraint-based tutors: what we have achieved and where we are going. User Modeling and User-Adapted Interaction, 22(1-2), 39-72

[11] Baker, R. S., & Inventado, P. S. (2014). Educational data mining and learning analytics. In International handbook of research on conceptual change (pp. 443-455). Routledge.

• Gradual introduction: Gradual introduction of adaptive teaching methods into the educational process, taking into account the readiness and capabilities of the institution.
• Scaling: Expanding the use of adaptive learning to all levels of the educational process and to all educational programs of the institution.

6. Performance assessment:

• Collection and analysis given: Collection and analysis of data on learning outcomes and student and teacher satisfaction with new teaching methods.
• Evaluation of results: Assessing the effectiveness of implementing adaptive learning based on the collected data and adjusting methods in accordance with the results obtained.

The process of introducing innovative teaching methods through adaptive learning in an electronic environment requires careful planning, coordination and feedback from all participants in the educational process. However, the successful implementation of such methods can significantly increase the effectiveness of training and the development of professional competencies of teachers.

Conclusion:

A study of the applicability and effectiveness of adaptive learning in an electronic environment for the development of professional competencies of teachers revealed several key findings that can serve as the basis for improving teaching methods through an electronic system.

First, adaptive learning is a powerful tool for individualizing the educational process and increasing learning efficiency. A personalized approach to each student allows us to take into account his individual needs, learning style and pace of learning the material.

Secondly, the effective use of adaptive learning requires not only the development of appropriate technological solutions, but also the readiness of teachers to integrate these innovative techniques into the educational process. Therefore, it is important to ensure sufficient training and support for teaching staff, including training in new methods and technologies.

In addition, the successful implementation of adaptive learning requires a systematic approach and effective change management in an educational organization. This includes not only technical support and infrastructure solutions, but also the active involvement of all stakeholders in the change process.

Finally, adaptive learning opens up new opportunities for the development of professional competencies of teachers. The introduction of innovative teaching methods through an electronic system can help improve the level of qualifications and develop the professional skills of teachers, which will ultimately lead to an improvement in the quality of education.

Thus, improving teaching methods through an electronic system based on adaptive learning is an important direction in the development of modern educational practice, which can significantly increase the effectiveness of training and the development of professional competencies of teachers.

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