

**APPLICATION OF NEW INFORMATION TECHNOLOGIES IN THE PROCESS OF
PEDAGOGICAL SOFTWARE**<https://doi.org/10.59982/18294359-24.15-ag-18>**Gagik Avetisyan**

EUA, Chair of Design

avetisyan.gagik.93@mail.ru

Abstract

The use of new information technologies in practically every field of activity in modern society defines the need for the development of elements of students' creative imagination. In the digital environment, the cognitive motivation of students is strengthened. The changes introduced by new information technologies in the development of students can have a cognitive, emotional, and motivational nature and affect their temperament and individual characteristics. One of the essential arguments accompanying the introduction of new information technologies in teaching is directly related to the increase in their educational and cognitive activity, which is expressed in the complexity of educational tasks, considering the capabilities of learners, as well as the choice of the maximum learning rate, the effectiveness of control, the increase of objectivity, and especially in the process of organizing pedagogical software tools.

Partial methodologies based on the application of new information technologies are used in the process of pedagogical software tools, depending on the educational goals or educational situations. In one case, it is necessary to understand the needs of the learner more deeply; in another case, the analysis of knowledge in the field of the relevant subject is important, as well as accounting for the psychological principles of learning. Accordingly, the use of new information technologies in the field of education as a means of disseminating information contributes to faster and fuller assimilation and dissemination of the material.

Keywords: Information technologies, modern education, software, digital environment, pedagogy, learners, concept.

Introduction

The implementation of new information technologies in education is one of the most complex tools for qualitative change in it. The use of new information technologies in the process of developing pedagogical programs is a very current topic. Relevance of new information technologies in the modern educational environment contemporary use of new information technologies, including technological advances, personalized learning, advanced and interactive learning, accessibility and inclusion, collaboration and communication. The integration of new information technologies into the development of educational programs has the potential to improve the quality, efficiency and accessibility of education, which makes it an important and significant topic in the field of education and educational technologies. The purpose of the presented article is to identify the reasons for the modernity of using new information technologies in educational processes and the conditions of expediency in the context of pedagogical software tools. Among them, the fact that the general technical preparation of students for the object of the researched problem should meet the rapidly

changing demands of current production is of primary importance, in addition, the results of the experiment attest to the trainees' increased activity, the value of independent work under information-comfortable conditions, and the best possible educational standards.

In particular, the use of new information technologies (IT) in the development of educational software is an important area of innovation and the development of educational methods. The scientific novelty of the research is primarily related to the development of adaptive learning systems, and the integration of tools based on artificial intelligence, such as intelligent learning systems (ITS).

All this can transform traditional educational paradigms, making learning more personalized, interactive and accessible. The scientific novelty of this research lies in its ability to use advanced technologies to solve modern problems in education, thereby creating a more effective and inclusive learning environment. The complete theoretical concept of learning new information technologies can adequately represent the essence of the problems it covers only if the didactic and empirical methods related to the organization of educational activities using innovative means in the most important pedagogical, psychological and special conditions are synthesized.

The study was conducted with the participation of students from Yerevan State College of Informatics. The reliability of the research results was justified by the fundamental provisions of the work methodology, which was ensured both theoretically and by a comprehensive analysis of test scientific experiments, in conditions of adequate consideration of the age, individual and artistic-pedagogical characteristics of students.

In order to support the argument that the issue of integrating new information technologies into the classroom is legitimate, the question's origins are examined. This involves comprehending the notion of digitization of education, incorporating contemporary information resources into the classroom, developing computer technologies for education, assessing the efficacy of pedagogical software training, determining the importance of the educator in the context of information technology, and keeping up with the rapidly advancing fields of artificial intelligence (AI) and software development.

The role of new information technologies in the field of education

The term "information" translated from Latin (informatio) means explanation, clarification. Information as a concept was developed by the American scientist Norbert Wiener, who noted: "Information is information, not matter or energy. Matter and energy do not disappear anywhere, but only pass from one form to another. In contrast, information can appear and disappear" [Wiener, 32]. Thus, the great scientist of his time emphasized the special and important role of information in the context of other processes, which became a stable platform for further research and analysis by specialists.

In the context of the study of information technologies, the principle of concept modernity is essential. According to UNESCO's assessment: "Information technology is a set of interconnected scientific, technological, engineering disciplines that study the methods of effective organization of the work of people involved in the processing and storage of information, the methods of organization and interaction with computer equipment, people and production equipment, their practical applications, as well as all this social, economic and cultural problems related to it" [Серебряков, 30].

New information technologies are closely related to the computer sphere, and technical failures in the latter significantly affect their application. In this context, the method of computer echolocation contributes not only to the construction of a security model of new information

technologies, but also to support the identification of structural and functional disorders in computer systems [Khoshaba, 577]. This is especially important in the format of education, where new information technologies can be considered as a methodology of the educational process using the latest innovative means, primarily a computer. Here, from the point of view of computer science, reflections were made on the relationship of some concepts of pedagogy, the virtual past, present, future, noosphere and its coevolution.

Most of the researchers (B. Gershunaki, E. Mashbitz, N. Nikandrov and others) identify the computer as the most important element of the information sphere of the educational institution. This is explained by the functional versatility of the computer, which became evident especially in the post-epidemic period, with the availability of using new information technologies in the educational process, which were qualitatively different from their predecessors (increasing speed, Internet publicity, increasing the amount of computer memory, distance learning, etc.). It gave birth and signaled new information technologies in pedagogical activity, such as multimedia, virtual reality, video conferencing platforms, etc.

It is reasonable to expect that the didactic opportunities on the basis of the information technology will increase rapidly. Let's emphasize that under the means of new information technologies, we mean software backup equipment in the digital domain, which operate on the basis of nanotechnology, as well as modern means and systems of information exchange, which ensure the exchange of information collection, realization, storage, storage and processing. the role. The first concept of digitization of education was developed by academicians D. Rams, A. Yershov, V. Monakh and others. The features of the changes taking place institutions are presented of the software tools developed by Safronova in the educational process.

It should be noted that the software and its penetration into the design process of the learning process require following the requirements of pedagogical software tools. The introduction of new information technologies into the educational process certainly requires a high pedagogical mastery of the teacher, the search for the development of certain pedagogical methods aimed at the formation and development of the technical thinking of students, therefore, the approaches developed in the process of improving the professional training of specialists in new information technologies can be used as ways to improve the quality of education in this field to decide.

The introduction of new information technologies in education can be considered, on the one hand, as a general process of publicizing innovative means, which spreads everywhere, and on the other hand, as a means of increasing efficiency. Here, of particular importance is the application of the principles of the theory of psychology of unified integrity.

This is also evidenced by the opinion of outstanding educators and rhetoricians that new information technologies are a powerful tool for the development of various abilities of students, especially creative abilities, which in that sense has an obvious advantage compared to all other traditional means. In this context, the process of self-learning is also important. According to pedagogue Robert. "Self-education implies the use of new information technologies not only as a means of controlling learning, but also as a tool for obtaining information" [Robert, 37].

In addition, we emphasize that if European studies focus on the pedagogical perspective, that is, the use of new information technologies as a means of teaching (N. Wirth, E. Dijkstra), then in the American experiment there is a certain tendency towards the technological direction of information and new technologies are considered mainly as an additional tool. The list can be summed up in the context of pedagogical software tools, which should be understood as the application programs designed to organize and support an educational dialogue between the user and the computer.

The functional role of pedagogical software means is the introduction and guidance of educational information, taking into account the individual capabilities and preferences of the learner. Pedagogical software tools are created and used to achieve certain pedagogical goals and objectives of learning. They usually include the learning material that the learner needs to master and the management part that determines the sequence of study of that learning material.

All the above-mentioned values of new information technologies are concentrated in the possible areas of pedagogical software tools, with which students work, and innovative tools act as a technical tool that implements the educational program. Currently, a significant number of pedagogical software tools have been developed in various fields of knowledge. There is a very simple pedagogical program that provides for the sequential delivery of educational texts and complex mental program compounds.

Let's consider the types of software tools, which are used for educational, in particular, functional and methodical purposes. It is appropriate to divide pedagogical software tools into the following types according to their functional significance:

1. Diagnostic and test programs that verify the causes of students' wrong actions, evaluate their knowledge, abilities, and determine their level of training or intellectual development.
2. Instrumental, software means that certify educational software (systems), educational-methodical, organizational materials, etc.
3. Subject-oriented software areas that implement the modeling of the studied objects or their relation to a certain subject area, organize educational activities with models, reflect the objects, the regularities of some subject areas.
4. Pedagogical software tools, which are intended for the automation of the process of processing the results of the educational test.
5. Management pedagogical software tools, the purpose of which is to manage the actions of real objects . for example, the actions of robots simulating the role of various industrial mechanisms.
6. Learning areas of programming, designed for the initial training of the ability to form the main components of the algorithmic style of programming thinking.
7. Pedagogical software tools that ensure the performance of some functions of the teacher: to give commands on working on the computer, instructions to stop work, to perform checks, etc.
8. Pedagogical software tools designed for the automation of information-methodical support process and operation.
9. Service software tools that ensure the user's work, management of the process of learning results.
10. Game software tools that are a means of securing various types of gaming and learning activities.

Types of software methods of methodological significance

The methodological significance of each type of pedagogical software reflects the methodological goal of its implementation in the learning process and the possibilities of pedagogical software tools, the implementation of which accelerates the learning process, brings it to a higher level: teaching software tools, software systems, monitoring, information search, informational, imitative, modeling, demonstrative, educational, etc [Creswell, 46].

In the context of the implementation of modern educational standards, where new information technologies are considered as starting tools, we present the below-mentioned classification of training programs:

1. Computer textbooks
2. Subject-oriented areas (microworlds, modeling programs, educational programs),
3. Modern laboratory conditions,
4. Monitoring programs,
5. Reference books, educational databases.

There is the following division of training programs:

- Drill & practice
- Step-by-step
- tutorial
- Software "discovery-learning".

There are programs designed to test and consolidate knowledge, practice skills and teach skills and abilities. The next group of software tools consists of programs that support the information retrieval activity of students, and, finally, programs in which strategy and tactics are chosen by the student. In this context, the role and significance of the formation of artistic perception among students is especially important. Let us note that in the methodological system for the formation of artistic perception of students in the modern education system, the processes of artistic perception of students, content and character are determined. [Avetisyan, 4].

The following main types of pedagogical software are used directly for theoretical and practical training:

1. Demonstration programs intended for theoretical training, using the material base of video lessons.
2. Control programs that are used when conducting input and output control of knowledge.
3. Teaching programs that are practical especially for the study of such educational material of an organizational nature, which is easily divided into sections and subjected to mastery control. With the help of these means, teaching consists of allocating a certain section to each student, and then controlling his assimilation of knowledge.
4. Professional software tools, which are used when the learner is given the opportunity to familiarize himself with and use the information technologies that he will have the opportunity to meet in the future in independent educational activities. These include practical graphics programs, programming packages, innovation systems, etc.
5. Computer learning areas that are used in the study of individual topics and departments, the mastery of which is aimed at the formation of functional abilities of mental operations. Their essence lies in the fact that students are presented with a mathematical and informative situational model of the studied material, phenomenon or process. By managing this model, the learner can study the behavior of the field, object, phenomenon, etc., clarify the meaning of this or that subject, learn the appropriate means of management.
6. New information technology fields of study, which are extracted from the net field in that the meaning of the managed means can be implemented thanks to a special interface.
7. Simulators of modern laboratories that enter the field of new information technology or are used independently.
8. Expert teaching systems, which refer to prospective pedagogical means, intended for the formation of the personal base of knowledge and skills of specialists.

9. Multimedia systems, which represent not only separate types of pedagogical software, but also advanced technology for use in the digital domain in such an educational process, which allows the combination of educational information resources.

10. Automated learning systems that enable the creation of control and training programs that operate specifically under different version control.

11. Authoring areas that have text, graphic and special editors that allow to create, display programs, educational areas and other pedagogical software tools that work independently or in the context of management of specially created authoring programs.

All the aforementioned typologies did not take into account the original meaning of the systems during development, so it is necessary to distinguish between the means created for use in educational processes and the means adapted for use in educational institutions (see Table 1).

Table 1. Software designed for use in educational and individual learning processes.

Software developed for use in educational processes. Served for the educational sector.	Software tools for use in customized learning processes. They serve to solve the problems of a wide range of applications.
They are created to solve educational problems. The technical capabilities available in educational institutions are taken into account.	Created to support professional activities. Developed in accordance with the latest achievements in the field of new information technologies.

Conclusion

Thus, the use of new information technologies in the field of education in the context of pedagogical software is a relevant topic of research. Summarizing our research, we came to the conclusion that:

1. Modern educational standards and the digital environment developing every year contribute to reforming the education sector, in particular the process of introducing new information technologies.

2. The use of new information technologies in the development of pedagogical software is the most important area of modern education. Based on this, some conclusions and recommendations are presented based on current trends and research.

3. New information technologies make it possible to create interactive multimedia educational content that increases student engagement and understanding.

4. Adaptive learning technologies allow you to personalize the learning process, taking into account the individual needs of students and the pace of learning.

So, most of the mental actions that students engage in at each stage of analysis are classified in educational or psychological literature as creative phenomena. As a result, new information technologies help students develop creativity, and when learning using a digital approach, the reaction process is triggered accordingly. Thus, with thoughtful and strategic use of new information technologies, the development of educational software can significantly improve the teaching and

learning process, making education more effective, inclusive and adaptive to the needs of the 21st century.

References

1. Avetisyan G. S., The methodological system of students' artistic perceptibility formation in the modern educational system. / Development of Education, Science and Business: Results 2022: Proceedings of the International Scientific and Practical Internet Conference, December 22-23, 2022. FOP Marenichenko V.V., Dnipro, Ukraine, pp. 4-5.
2. Creswell J., Educational research: Planning, conducting, and evaluating quantitative and qualitative research (5th ed.). Boston, MA: 2015, Pearson Education, Inc. 121 p.
3. Khoshaba O. M, Fundamentals of computer echolocation in distributor structures, New information technologies, simulation and automation: Monograph / Velychko V., Voinova S., Granyak V., et al; Editor-in-Chief Kotlyk S. Iowa State University Digital Press, 2022, p. 577
4. Robert I., Monograph. Information-educational space. FGBNU, 2017, 92 p.
5. Wiener N., A Life in Cybernetics, The MIT Press, 2018, 528 p.
6. Серебряков Н. Г., Основы информационных технологии: пособие, Минск, БГАТУ, 2015, 400 с.

Ներկայացվել է՝ 07.03.2024թ.

Ուղարկվել է գրախոսման՝ 21.05.2024թ.