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THEORETICAL ANALYSIS OF THE DEVELOPMENT OF MODERN DIDACTIC INTERACTIVE SOFTWARE SYSTEMS IN TEACHING THE SCIENCE OF ELECTRICAL MACHINERY

Niyazov Jasur Abdirasulovich
The Reseacher of the Karshi Engineering- Economics Institute

A B S T R A C T	K E Y W O R D S
The article reflects on the history of the development of mediata education and mediata education and the main aspects of the system of mastering and mediata education, the history and methodology of teaching mediata education. In addition, the main reasons for the consumption of media in digital media are given.	Pedagogy, mass media, digital technologies, television game, internet.

Introduction

Computerization in the field of electrical engineering education has its own historical consistency. The programs created at the initial stages are primarily intended for automating constant and repetitive calculations, formalizing educational documents and processing experimental research data. Acceleration of practical calculations achieved by the use of such tools led to an increase in the volume of completed work, and consequently, to a deepening of knowledge in the field of science and computer technologies. In other words, students and teachers got a computer - a powerful tool that allows them to use their study time effectively and frees them from a large amount of daily work.

Today, due to the development of computer technology, high demands are placed on computer programs used in the field of electrical energy education, in particular, the creation and use of computer training programs is aimed at meeting the needs of educational services that meet the individual requirements of a person. should be [Babayev et al., 1998]. [Panyukova, 1998], [Bespalko, 2002] mentioned the need for a personal approach in modern computer-aided teaching.

These requirements are also relevant in terms of traditional problems such as reduction of study time in electrical engineering education for students of higher education institutions. An analysis of the latest state education standards shows a reduction in the number of hours allocated to the study of electrical engineering [Krasnopolsky, 2003]. Thus, modern computer technologies should solve the conflicts between the continuous growth of the volume of information and the limited time of educational activities [Dmitriyev, Polsky, 2002]. In such conditions, the process of organizing students' educational activities should be automated.

Analysis of Literature on the Topic (Literature Review)

Today, Electronic textbooks (ED) ensure the completeness and continuity of the didactic cycle: they provide the student with theoretical material, provide active learning activities, give individual

learning tasks, monitor students' step-by-step actions, return provides communication and evaluates [Zaynutdinova, 1999, a].

In this study, the materials of the international scientific-methodical conference "New information technologies in electrical engineering education" (NITE) are analyzed [Materials, 1998, 2000, 2003]. About 240 articles were reviewed in total. In doing so, we analyzed the articles dedicated to the specific features of the process of teaching electrical engineering subjects using ED in the following aspects - to determine the possibilities of organizing and automatically managing students' learning activities at different levels.

Management of students' cognitive activity is an integral part of the didactic process. N.F. In Talizina's work, a synthesis of the general theory of management (cybernetics) and the psychological-pedagogical theory of teaching in accordance with its requirements was proposed.

The founders of programmed education V.P. Bespalko, P.Y. Galperin, B.F. Skinner, N.F. Talizina created the scientific base and methods of programmed education and developed the general principles of using teaching machines in the educational process.

According to the American psychologist Skinner's model, during the learning process, all students go through the same sequence of educational information frames predetermined by the author, including this sequence depends on the student's actions during the training. it won't happen. Thus, in Skinner's linear programs (under the program is understood the method of organizing educational information), adaptation to the student is achieved only due to the different time required to master the material [Skinner, 1965].

Alternative to linear programs are branched programs. V.P. According to Bespalko's tariff, the structure of branched programs should provide exactly one educational information at three or four levels of complexity. The transfer of a student from one level of complexity of information presentation to another is carried out according to a certain criterion, for example, the value of the mastery coefficient is used - the percentage of correctly performed operations in the student's work. Thus, the teaching method may be different depending on the individual characteristics of the student [Bespalko, 1979]. In Bespalko's branched programs, adaptation is carried out not only in terms of learning time, but also in terms of the volume of educational information and the order of its presentation.

Controlling the process of mastering educational activities depending on the programmed education was studied in depth in the work of [Talizina, 1984].

In the work of Zaynutdinova, the possibility of managing students' educational activities with the help of ED was studied. In this, the high importance of automated management of the educational process is noted.

Research Methodology (Research Methodology).

"New information technologies in electrical engineering education. 60 articles from the materials of the fourth scientific and methodical conference "NITE-1998" were analyzed. In this case, only in 14 studies we identified information on the use of ED to organize learning activities of students at different levels of mastery. Among them, 13 jobs are supposed to reach b1 level, 10 jobs - b2 level, and one job - b3 level [Gladishev et al., 1998]. None of the EDs described by the authors in the "NITE-1998" collection of materials includes creative tasks.

Having analyzed 80 articles from the materials of the international scientific and methodical conference "NITE-2000", now in 23 cases we have identified the possibilities of organizing educational activities of students with the help of ED at different levels of mastery. Among them, it is planned to reach level b1 in 19 jobs, level b2 in 14 jobs, level b3 in four jobs, and level b4 in only one job [Amosov, Vlasova, 2000]. Thus, a slight increase in the number of DIDT (compared to the corresponding materials in 1998) can be observed, in which it is possible to set educational tasks that correspond to the effective learning activity of students.

When analyzing 100 articles from the materials of the international scientific-methodical conference "NITE-2003", 18 articles revealed the possibilities of organizing students' learning activities with the help of ED at different levels of mastery. Among them, it is planned to achieve b1 level in 14 jobs, b2 level in 8 jobs, b3 level in 2 jobs, and b4 level in only one job [Sherbakova, Stegansev, 2003]. Compared to the materials of 2000, the number of DIDTs, where it is possible to assign educational tasks corresponding to the effective learning activity of students, has not changed much.

We summarize the results of the analysis of publications on the potential possibilities of ED in terms of organizing the learning activities of students at different levels of mastery.

The total number of articles presented in the materials of international scientific and methodological conferences "NITE-1998", "NITE-2000" and "NITE-2003" is 240. In this case, only 55 cases considered the use of ED to organize educational activities of students at different levels of mastery. In relation to the number of these publications, it is possible to determine the number of articles (in percentage) that are expected to reach the b1, b2, b3 and b4 levels of mastering the activity.

Figure 1 shows a histogram showing the use of electronic textbooks for organizing learning activities at different levels of mastery.

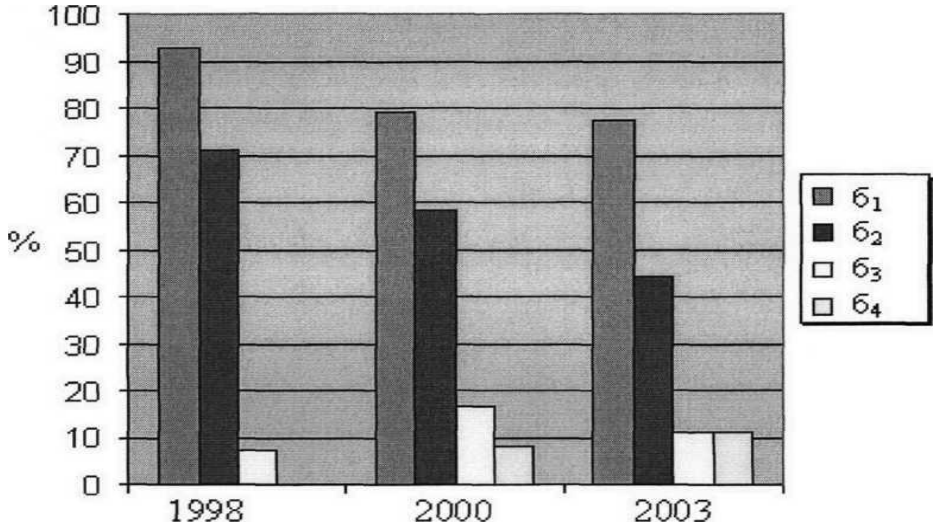

Figure 1. Publications on the use of electronic textbooks for organizing educational activities and their (by mastery levels).

b1-level - knowledge-acquaintance, b2-level - knowledge-copies, b3-level - knowledge-heuristics, b4-level - knowledge-transformation.

We also reviewed the materials of international scientific and methodical conferences from the point of view of organizing automatic management of students' learning activities using ED. In the "NITE-98" collection, the problems of automating the management of students' learning activities within the framework of electronic education were considered in only 14 lectures. These publications constitute a minimal share of total publications. The authors of 7 lectures talk only about the software for

automatic management of students' educational activities based on the final result. The remaining 7 cases talk about the implementation of feedback during the assignment. As a result of the analysis of the materials of the "NITE-2000" and "NITE-2003" conferences, approximately the same results were achieved.

According to the results of the analysis of the materials of the international scientific and methodical conferences "New information technologies in the field of electric power" (NITE) in 1998, 2000 and 2003, the following were determined:

The analysis of the experience of using universal modeling software systems during the teaching of electrical engineering shows that physical experience is an integral part of the educational process in the teaching of electrical engineering. The training of future specialists in technical HEIs requires extensive study of natural sciences and technical sciences using the methods of laboratory workshops [Cherkasskaya, 2001].

The use of software and computers as "virtual laboratories" significantly expands the possibilities of experimentation in relation to physical modeling, as well as reduces large material costs for the production of specialized models [Polsky, Andreichik, 2003].

Currently, in many HEIs, laboratory classes in the field of electrical engineering are conducted using computers and MathCAD, Microcap, Electronics Workbench, etc. is carried out with the help of universal modeling software systems (UMST).

MathCAD is one of the most popular mathematical systems. It has a wide collection of instrumental, information and graphic tools. [Laptev, 1995; Shamailo, 1995; Kudryavsev, 2001], the advantage of this package is the ability to accept and repeat the almost natural form of writing the conditions of the problem and its solution using the usual mathematical rules and symbols.

Microcap - developed by Spectrum Software. The program synthesizes electrical circuits, compiles library components of leading Japanese, European and American companies, speed, accuracy, etc. has wide possibilities [Rezvig, 1998].

Electronics Workbench is a development of Interactive Image Technologies. The uniqueness of this program is the presence of a wide set of control and measuring devices and elements, which are maximally close to industrial analogues in terms of appearance and control bodies. After creating a scheme and simplifying it by executing sub-schemes, modeling begins with a simple switch [Karlashuk, 2000, 2004].

The Electronics Workbench system is the most popular program for modeling electric circuits [Alyokhin, 2003]. It stands out from the rest with its ease of programming, availability of familiar gauge models, and a wide array of elements. Such a "virtual laboratory" provides a natural sequence of experiments [Electronics Workbench..., 1996].

In this study, the materials of the international scientific-methodical conferences "New information technologies in electrical engineering education" (NITE) are analyzed [Materials, 1998, 2000, 2003]. In particular, the publications devoted to the specific features of the process of teaching electrical engineering sciences with the help of UMDT were reviewed.

More than 240 articles were analyzed during the research. It was found that a large number of authors use UMDT in the educational process of their subjects in the field of electric power. Of the 240 publications we reviewed, 39 articles covered the authors' experience of using a particular UMDT. In 26 works, the authors describe their experience using Electronics Workbench, 18 - MathCAD, 12 - Microcap, and 11 many other UMDT systems (for example, Mathlab or Mathematica). The results of

our analysis, which reveals the level of use of different types of UMDT in the educational process of electrical engineering sciences, are shown in Figure 1.2.

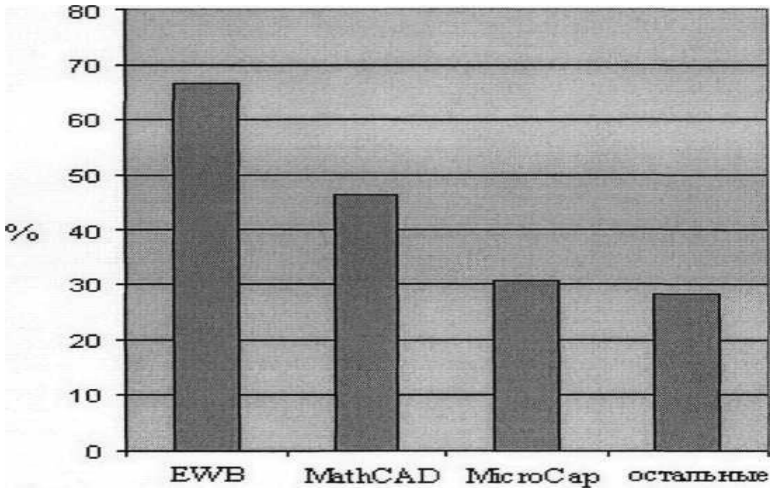

Figure 2. Use of universal modeling software systems in the process of teaching subjects in the field of electric power.

Thus, based on the analysis of the materials of the international scientific and methodical conferences "NITE-1998", "NITE-2000" and "NITE-2003", we found out that Electronics Workbench and MathCAD programs are the most used in the educational process of subjects in the field of electric power. UMDT is used.

These systems, developed by the world's leading companies, have a wide range of capabilities. Based on them, it is very easy to organize various educational subjects: electroenergetics, basics of circuit theory, electroenergetics, electrical measurements and other laboratory exercises.

REFERENCES

1.Медиаобразование. Российская педагогическая энциклопедия. Т.1/ под ред. В.В.Давыдова.– Москва: Большая российская энциклопедия,1993.– 555 с.

2.Федоров, А.В. Медиаобразование: История, теория и методика / А.В. Федоров – Ростов-на-Дону: ЦВВР, 2001. – 708 с.

3. Bazalgette C. Primary Media Education: A Curriculum. Statement London: BFI, 1989, 125 p.

4.Nekboyev Kh. Kh. Mechanizms of the influence of mass media on the development of personality under the conditions of media// European joutnal of Research and Reflection in Educational № 1, 2019. 53-55 pp.

5.Nekboyev Kh. Kh .The influence of mass media on the development of personalitymodern conditions//Научные исследования-основа современной инновационной системы: Международной научно-практической конференции. Россия,2019. – С.49.