

Technology of Creation of New Generation Electronic Textbooks to Improve the Quality of the Educational Process in the Higher Education System



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ABSTRACT: Among the various traditional textbooks in the education system, the textbook occupies a special place due to its importance. Because it is the most effective and most common didactic resource, it serves as a learning tool for learners. One of the important issues in the system of higher education is the creation of a new generation of textbooks based on information technology that meet modern pedagogical requirements. Quality textbooks increase the interest of students and play a special role in the quality and effective organization of the teaching process, especially in the quality organization of distance education, good reading, learning and effective mastery of the new generation of e-textbooks. Today's society is a society in which science is rapidly developing, information flows are increasing rapidly, modern information and communication media are widespread, in which the rapid updating of knowledge in various fields of science, as well as their rapid acquisition by students puts the task of learning. In particular, raising the rating of higher education institutions, the formation of sectoral educational resources through the introduction of mechanisms for the integration of education, innovation and production activities based on the effective use of domestic innovative potential, improving the competitiveness of the education system, attracting investments, innovations and IT technologies issues such as.

KEYWORDS- higher education, e-textbooks, distance learning, quality of education, technology, innovation

I. INTRODUCTION

Rapidly developing new information technologies cover all aspects of human life and activity and have an impact on the development of the state, science, technology and all sectors of the economy.

One of the most important areas that reflects the achievements of scientific and technological progress in the first place is the field of education. Education itself is a factor that ensures the future of individual countries and all mankind, and is a driving force that accelerates the development of society. It is known that textbooks and teaching aids, as well as other teaching materials play an important role in improving the quality of education. Existing traditional textbooks based on print media have not been sufficient to achieve the informational goals associated with the application of information technology in education.

Therefore, the creation of new electronic resources and their implementation in the educational process has become an urgent problem of informatization of education. In this regard, the creation of e-learning literature and their application in the educational process is of great importance. The tendency to strengthen the independence of students, the requirements for the content of educational material, as well as the further individualization of tasks of a supervisory nature, the transition to an information-communicative form of independent education is determined by changes in society, the intensification of the informatization process.

The use of information technology in distance education allows students to work with printed literature as well as educational programs, test systems, databases and other electronic resources. Although all electronic publications can play a supporting role in organizing distance learning for students, multimedia is the most effective of these. The effectiveness of the use of information technology in distance learning depends largely on the successful solution of methodological tasks related to the content of the material and the method of using automated learning systems. Therefore, in distance learning it is expedient to use automated educational systems in the form of software and methodological complexes created on the content of a

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specific curriculum. Such systems may include various e-books, special programs designed to replicate or systematize knowledge, programs for accessing remote information resources, knowledge monitoring, automated systems for assessing skills and competencies, and more.

E-learning literature is a resource that has the ability to collect, describe, update, store, present and control knowledge through communication based on modern information technology. E-learning literature is classified into various categories, including all e-learning publications, from e-lecture texts to e-textbooks. Among them, the e-textbook has a special place as a teaching tool that creates a wide range of opportunities for the use of teaching materials in the educational process. Experience has shown that a person can remember information received with the help of the visual organs 5 times stronger than the auditory organs. Unlike auditory organs, information received from visual organs is not encoded, goes directly into memory, and is stored for a long time.

The e-textbook is designed for the use of computer-based teaching methods, independent and distance learning, as well as the effective use of scientific teaching materials, scientific information.

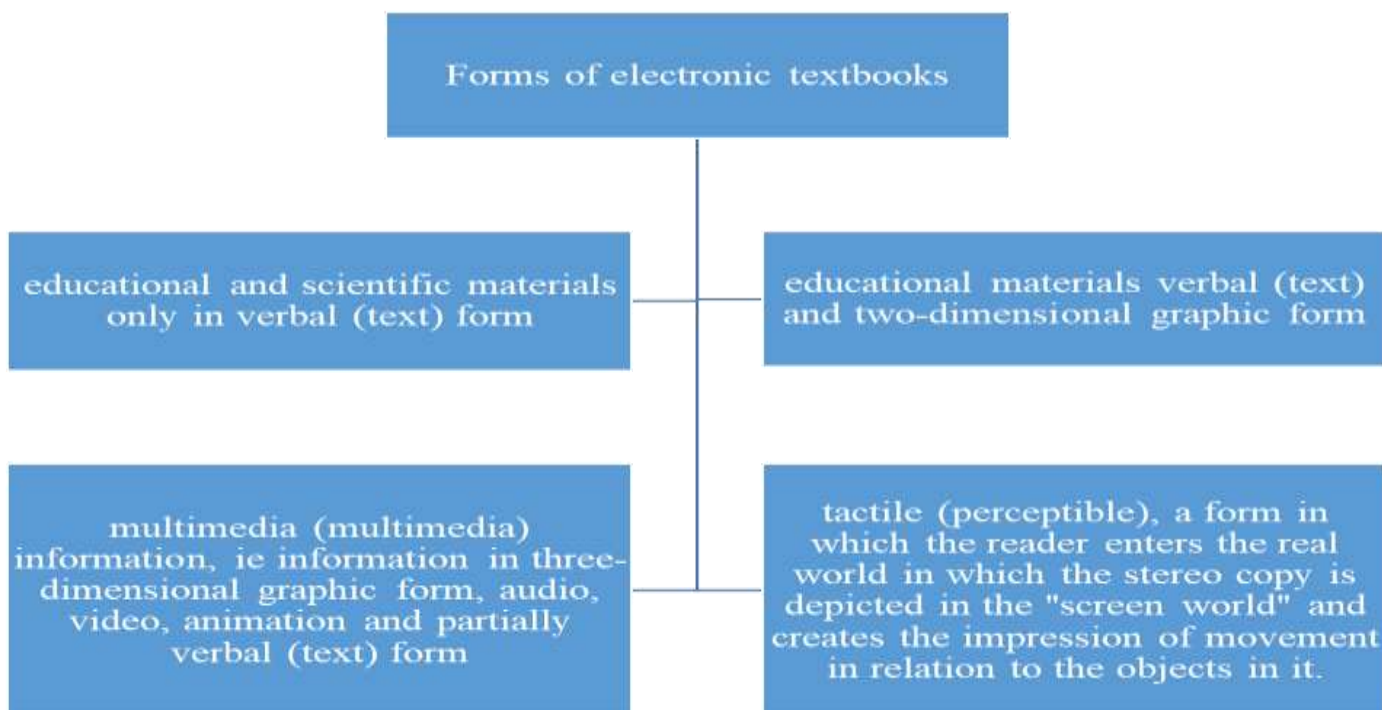


Figure 1. Electronic textbook forms1.

The e-textbook provides more opportunities to demonstrate teaching materials than traditional textbooks. The e-textbook should meet all the requirements for the learning process, as well as perform didactic functions designed for students to work more independently. Therefore, in the implementation of e-textbooks in the educational process, in addition to their pedagogical aspects, taking into account the psychological and hygienic aspects will ensure the intellectual abilities of students and their active participation in this process. The organization of the educational process on the basis of e-textbooks provides a number of advantages, such as rapid updating of teaching materials based on the latest achievements of science, the advantage of e-textbooks over traditional textbooks is its "intellectual" power, as well as the ability to provide information in a timely manner. is evident in the presence of An e-textbook should contain all the relevant teaching materials on a particular subject, and its intellectual level, in turn, has a number of advantages over an ordinary textbook. For example, rapid search for information, level of mastery of topics using multimedia and graphic elements, etc. [1].

An electronic publication is a collection of graphic, text, digital, speech, music, video, and other information objects. Electronic publication can be provided on magnetic (magnetic tapes, disks), optical (SD-ROM, CD-I, CDK, CD-R, CD-RW, DVD) electronic media and on a computer network. An e-learning publication is an electronic publication that has a structured learning material appropriate to the field of scientific and practical knowledge that enables learners to actively acquire knowledge, skills and abilities. An electronic dictionary is a source of electronic information that corresponds to a traditional

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"paper" dictionary. In the computer version, a word or group of words can be extracted from any program with a special instruction. Unlike traditional dictionaries, an electronic dictionary can contain a full spectrum of media objects, along with text and graphic images, as well as video and animated clips, audio music, and more.

II. RESEARCH METHODOLOGY

In The Research Process, The Methods Of Economic Analysis, Comparative Comparison, Abstract Logical Thinking, Monographic Observation Were Widely Used.

III. THE MAIN PART

Modern trends in the development of the world economy are closely linked with the growing role of information technology in society. The economy is changing and innovations are taking place. At the heart of these changes are personal computers, high-speed telecommunications and the Internet.

Each e-textbook must be in a separate form and meet a certain standard requirement. An e-textbook is a textbook based on the use of a computer-based teaching method and the comprehensive and effective assimilation of science-based teaching material, which may apply to one of four levels.

Table 12. Four levels of study material

| | Interpretation of levels of study materials |
|-----------|--|
| 1- degree | an electronic textbook that presents the study material only in verbal (text) form |
| 2- degree | an electronic textbook that presents the study material in verbal (text) and graphic (pictorial) form |
| 3- degree | multimedia textbook, ie a multimedia electronic textbook in which information is presented in three-dimensional graphic form, audio, video, animation and partially verbal (text) |
| 4- degree | The textbook material is presented not only in sound and three-dimensional spatial form, but also in tactical (perceptible, perceptual) data, which allows the learner to enter the real world depicted in a stereon copy of the "screen world" and the movement of objects in it. |

E-textbooks of all categories create great opportunities for increasing the efficiency of the educational process and the organization of independent learning of students and distance learning.

The main purpose of using e-textbooks is to form new information, educational methods, increase the efficiency, quality and productivity of the educational process through the use of modern information and pedagogical, information and computer technologies, modern educational resources in continuing education, the widespread use of e-textbooks. Organization of libraries, introduction of distance learning methods in education and access to the global e-learning system.

To achieve the pedagogical goals outlined above, an e-textbook must meet certain didactic, pedagogical, and psychological requirements. Didactic requirements include scientificity, ease of acquisition, problem-solving and comprehensive knowledge, active and conscious participation of students in the learning process, systematic and gradual implementation of knowledge, ensuring the acquisition of knowledge, knowledge acquisition, development, and expertise in the education system. the integrity of the responsibilities of staff and facilitators, ensuring that learning is independent for the learner, the interactivity of teaching, ensuring the coherence of teaching, and systematic approaches to the presentation of learning material.

Psychological requirements include requirements that reflect the aesthetic, hygienic and medical-psychological aspects of the e-textbook. This is because the human body requires specific features of receiving information in electronic form. Not only its content but also factors such as size, appearance of letters, color and movement of the image play an important role in the reception of data. Therefore, the text of the electronic textbook should have its own characteristics.

Such features in an e-textbook, such as blurring, color highlighting, underlining, and sound, have a strong impact on students' ability to absorb information quickly. To solve these problems, it is necessary to improve the quality of the information provided and create a number of opportunities in the electronic textbook, which can be used to change many parameters [3].

² Usmonov M. Interactive e-learning courses as a new tool for teaching activities. // "People's education" magazine, 2011, issue 6. –22-23-b.

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For example, mute, lower, raise, change colors, and so on. Achieving the effectiveness of the electronic textbook is based on taking into account the psychological aspects of interaction with the computer, which are the verbal-logical, sensory of the presentation of educational material, the process of cognition (cognitive); should correspond to the level of perspective (feeling, perception) and expression.

Also, the psychological processes associated with cognition include the reception of information (mainly seeing and hearing, feeling), attention (its stability, concentration, transition from one thing to another, distribution and level of attention), thinking (theoretical understanding, practical-visual and practical) -movement), imagination, memory (instantaneous, short-term and long-term, short-term, short-term memory placement of information), etc .; the e-textbook includes basic requirements such as user-friendliness, a creative approach to learning the science, and the creation of optimal working conditions for health.

Skills in the use of information and communication technologies, the basics of information and communication literacy, the ability to adapt to the conditions of information flows and rapid exchange of technologies are the main requirements of the modern labor market. It is these skills and abilities (practical application of knowledge, creative thinking, etc.) are formed in the case of full integration of these tools into the educational process. Exploring new forms and methods of (personal-oriented) learning for students through the computer and the Internet is an effective way to change the quality of education in line with the conditions of development of a science-based digital economy.

Due to the specificity of the process of informatization of education, knowledge management requires a special analysis of the IT technologies used and their wide application in the education system. In addition, this factor is aimed at ensuring a modern system of training and the growth of human capital necessary for the technological development and modernization of the country's economy.

The level of use of IT technologies in education depends not on the number of computers, communication equipment or Internet access in higher education institutions, but on the introduction of these tools in the education and research sector, the creation of multifunctional virtual resources, effective use of digital technologies to further improve higher education management. Determined by quality indicators.

Table 23. Four levels of study material

| No | | Interpretation of levels of study materials |
|----|-------------------------------|---|
| 1 | The principle of modularity | The study material should be divided into sections consisting of modules (sections) that are small in size but integral in structure. |
| 2 | The principle of completeness | Each created section (module) should consist of the following constituent terms: theoretical part, structured control questions to test theoretical knowledge, tests, assignments for independent solution and exercises aimed at learning practical skills, experiments and historical commentary. |
| 3 | Demonstration principle | Each section (module) should consist of a sequence of frames with small sizes of texts that make new concepts, ideas, and styles easier to understand and remember. |
| 4 | The principle of branching | Hypertext links from each section (modules) should be used to link other sections so that the user can easily choose to switch to other sections at any time. The principle of branching does not limit the materials of the subject under study, but involves the gradual mastery of the subject. |
| 5 | The principle of governance | Learners should be able to independently manage the exchange of screen frames themselves, and be able to display any topic or information, concepts, ideas, illustration materials, and multimedia. Students will have the opportunity to test their knowledge and skills by answering control questions and tests, as well as practical exercises. |
| 6 | The principle of adaptability | The e-textbook should be able to adapt to the specific needs of the user in the learning process, to change the depth and complexity of the material studied and the practical orientation of the learner depending on the next stage of |

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| | | education. Users should be able to create additional illustration materials according to their needs, and be able to interpret the concepts being studied graphically and geometrically. |
| 7 | The principle of computer support | In this regard, learners should use a computer at any time during the learning process to review and complete assignments and issues that encourage attention to the nature of the learning material. The computer must not only perform complex switching operations, various calculations and graphs, draw pictures and diagrams, but also perform operations at various complex levels. Pre-studied and obtained results should be reviewed not only at the response stage, but also on a voluntary basis. |
| 8 | The principle of aggregation | It should allow the e-textbook to be expanded and supplemented with new sections and topics, science and technology news, and to create e-libraries for special and individual subjects or private e-libraries for learners (depending on the specialty and course they are studying), teachers or researchers. |

In the process of creating an electronic textbook, didactic, methodological, psychological-pedagogical, technical-technological, aesthetic and ergonomic requirements are set. The general requirements for an electronic textbook are as follows:

1. The structure and content of the electronic textbook should correspond to the curriculum of the studied subject, as well as to the in-depth study of the educational material.
2. Provides sufficient depth and reliability of the content of educational material, taking into account the latest achievements of science, technology and engineering in teaching. The process of mastering the learning material using an electronic textbook should be built in accordance with modern teaching methods. For example: experiment, experiment, comparison, observation, abstraction, generalization, rounding, similarity, analysis and synthesis, modeling method, as well as mathematical modeling and systematic analysis method.
3. Requirements for the achievement of teaching - is carried out through an electronic textbook and indicates the need to determine the level of complexity and depth of study of the learning material, specific to the age and individual characteristics of students. It is not possible to over-complicate and overload the learning material, in which case the learner will be unable to master this material.
4. Requirements to ensure the difficulty of teaching. If a learner tries to complete a problematic task and exercise, his or her thinking activity will increase. The level of fulfillment of this didactic requirement using e-textbooks will be significantly higher than that of traditional textbooks and manuals.
5. Demonstration requirements for teaching imply the need to take into account the sensitive perception and personal observation of the objects being studied by learners, their mock-ups or models.
6. Requirements for teaching awareness, independence and activism of the learner - provides for the provision of electronic textbooks and tools for independent and creative work of learners to involve educational information in achieving the ultimate goals and objectives of educational activities.
7. Requirements for the structure and sequence of teaching in the use of e-textbooks - means that a certain system of knowledge and skills in the field of study provides a sequence of mastering by students. Knowledge, skills and abilities must be formed in a logical order in the education system and find their place in life.
8. Requirements for the robustness of the acquisition of knowledge in the use of e-textbooks - it is important to develop the ability of students to think deeply, to memorize, so that they can master the learning material.
9. The developmental and educational functions of e-textbook teaching should be fulfilled.
10. The content and structure of the e-textbook should meet the requirements of the educational standard.
11. Automation of such aspects of e-textbook learning activities as search, collection, storage, analysis, processing; automation of calculations, design and construction, experimentation, processing of experimental results, control tasks, information processing.
12. The electronic textbook should contain simulations of work of complex objects (machines, the equipment, the apparatus, devices, etc.), means of transition of various processes in real, accelerated or slowed time scale.

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13. E-textbook training tools should train the learner in a virtual environment, depending on his future professional activity [4].

IV. CONCLUSIONS

E-textbooks provide a wide range of opportunities for educators and students. The organization of the educational process on the basis of e-textbooks brings a number of advantages, such as the rapid updating of teaching materials based on the latest achievements of science and the like.

Also, the individualization of the learning process occurs as a result of the use of electronic means of teaching in education. Each student will have the opportunity to master the material on the basis of the plan, based on their individual abilities. This can lead to better-assisted students progressing more slowly than poorly-assisted students.

An e-textbook can also be used to monitor the level of mastery of knowledge. At the same time, it will be necessary to include a monitoring system. Tests can be given on each section. Test results are determined using a computer. The test results can be used by the teacher in the current or intermediate assessment. Properly designed tests give an idea of how well a student has mastered the topics covered. It is possible to repeat the topics that have not been mastered.

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