# USE OF ELECTRONIC TEXTBOOKS IN TEACHING MATHEMATICS: PROBLEMS AND SOLUTIONS

**Jumayev Sanjar Saydullayevich*; Oltiyev Azizbek Bayramovich**; Ubaydullayeva Sabina Ilgor kizi*****

*Senior Teacher,
Navoi State Pedagogical Institute Department of "Mathematics",
Navoi, UZBEKISTAN
Email id: jumayev_sanjar_@umail.uz

** Teacher,
Navoi State Pedagogical Institute Department of "Mathematics",
Navoi, UZBEKISTAN

***Student
Navoi State Pedagogical Institute Department of "Mathematics",
Navoi, UZBEKISTAN

**DOI: 10.5958/2249-7137.2022.00165.3**

## ABSTRACT

*In this article, the development of mathematical thinking and the imagination of students in the teaching of mathematics reveal the role of electronic textbooks, the requirements for them, and their types. The creation of an ET in mathematics should address the humanities and universal values as much as possible paying attention to distance learning the student cannot interact directly with the teacher. The didactic and methodological aspects of the general laws of teaching, which are determined by the teaching mathematics are interrelated and are related to the issues of the program for the implementation of ET in practice.*

**KEYWORDS:** *Mathematics, Thinking, Imagination, Electronic Textbook, Thought, Computer, Education.*

## INTRODUCTION

Knowledge of the basics of mathematics is an integral part of one's spiritual culture. Mathematics poses certain challenges to students as one of the most complex subjects in school education.

For instance, these difficulties are due to the lack of spatial imagination of students in stereometry. Lack of figurative imagination necessitates the memorization of large amounts of constant information. These and similar features of geometry and mathematics make it necessary to use multimedia electronic means in their study. An e-textbook (ET) is a system of teaching software designed for integrated use, ensuring the continuity and didactic excellence of the teaching process **[1].**

The creator of the electronic textbook is assigned the following tasks taking into account the above:

- e-textbooks ,textbooks, mainly increase the level of knowledge provided to the student, that is increase the level of mastery of the subject;
- Formation of national information resources;
- Control over the level of knowledge of the student at the initial and final stages of the educational process;
- -give an opportunity to link the educational process with life and work;
- Transition from traditional methods of teaching to methods based on innovative technologies;

Computers and office equipment serve to organize views as a means of learning but not as computing machines.

New media, such as video, satellite, cell phones, and information networks are being widely used in the next decades of the 21st century. There have been significant shifts from one-way communication to interaction and communication. In this case, the traditional forms of media were implemented using computers. Mobile devices (Iphone, Android), image, sound and text are combined in computers and audiovisual culture has become an integral part of our daily lives.

**Types of electronic textbooks:**

- A textbook (hypertext) designed for independent study and in addition to methodological materials, which includes surveys, glossaries, scientific classification of educational material, exercises for their algorithmic mastering and a textbook with list of skills;

- Video lectures that provides action to educational material (uses auditory and visual channels of information reception), as well as recorded audio lectures that enhance the absorption of educational material by emotional impact on the listener ;

- Educational materials (active participation in the educational process), which are taken to the lessons (active seminars) organized in the form of seminars, using the capabilities of overhead projectors and projectors or multimedia projectors, changing depending on the mastery of the studied subjects by students ;

- Educational computer programs in the form of super tutors (training programs), proftutors (training materials based on professional programs), comp-plays (computer games related to robots and networks). These tools can be used as a workshop option for both group work and independent learning;

- active seminars in the form of discussions, "round tables", role-playing games, work games and other forms of play that involve the active use of knowledge and skills of each student imitated to professional situations ;

- Fiber-optic cable networks which connects the student via satellite or inateractive television which allow to connect a team of many university centers and their best professors to a single network of feedback programs;

- WAP Internet-enabled mobile Internet connections;

- Problem reports of experts and scholars that allow students to communicate directly with reputable people in the field (indicating the level of development of knowledge in the field of study);

- Written and oral course work (on videocassettes);

- Practices, as well as international practices that introduce students to their professional activities and develop their creative potential;

- Problem-based seminars in the form of student presentations or general discussions on scientific reports and lectures;

- Standard tests in the form of questions for each unit (unit) with the possibility of choosing alternative answers that cover the entire course material;

- Computer master-test programs which determine the knowledge of students in each didactic unit of the subject or parts of it (they provide the teacher with complete information about the knowledge of the student in the field) .

ET includes the following teaching tasks:

• provide theoretical information;

•organize the application of initial knowledge, monitor the level of knowledge acquired and implement interactive communication;

• ensuring independent learning.

From the earliest days of working with e-textbooks the implementation of all stages of the didactic form of the computer-assisted learning process saves time that students spend studying and ensures the integrity of the didactic process. ET allows the learner to organize the learning process at a high level such as working comfortably and interacting with the computer. ET has strong networking capabilities and allows learners to work actively with learning material. However, it should be noted that ET cannot replace the traditional book. ET is as a extra textbook aid as a new type of teaching materials. It is not enough to take a good textbook and create an ET provided with a large amount of text and illustrations and display it. The function of ET is different; it should not become a source of pictorial text or data. ET is not only a complex but also a whole didactic methodical and interactive programming system which has the ability to to present educational material in a variety of rich forms to provide information about research methods using analogy with multimedia tools. The advantage of ET is that it presents the material in bright colors, visually, in a way that is understandable to students moreover is somewhat more effective than the traditional teaching process because it is based on direct observation of objects and events in the reading process. The didactic and methodological aspects of the general laws of teaching, which are determined by the teaching mathematics are interrelated and are related to the issues of the program for the implementation of ET in practice.

ET uses computer explanation to facilitate some important concepts, examples and active recall and comprehension by engaging emotional memories in the learning process.

**The features of ET in mathematics are the followings:**

• allows you to use most of the data (tasks, tests, exercises, examples and samples) stored on the carrier (CD or hard drive) quickly;

• Modern computer-based e-textbooks allow you to significantly increase the speed of learning;

• have the ability to analyze responses and demands of students;

• interactive work of learning materials with the learner communicates with students and performs some of the teacher's tasks, including informing, advising, supervising (verbal and nonverbal drawing, color, sound message);

•the possibility of correcting one's own actions based on a counseling task shows that there is feedback we can see **[2].**

Student help information detects errors in computer memory by the reader or automatically. The presentation of this type of information depends on the structure of the ET.

Lessons based on ET are organized taking into account the individual charactes of the students. The study, repetition and control of a material is carried out at different levels of complexity, individual consistency and individual tempo.

In the process of computerized mathematics lessons it is possible to collect information about class work and analyze statistics without adversely affecting the course automatically.

A key part of the mathematics teaching methodology based on ET requires the following essantial elements:

• New computer-based lesson plans;

• Each item of the manual (written and electronic) for one hour of training have specific recommendations according to the module;

• provides detailed information on the content and capabilities of computer packages, methodical recommendations for their use in the classroom, homework and supervision. **[3]**

The difference between ET teaching and the traditional teaching process is it takes into consideration to protect the learner during the enlargement of didactic units and the creation of a base of units during its transition from one study level to another, which can be addressed at any stage of the learning process (apart from supervision and assessment steps). The structure of the knowledge base allows the learner to apply at its current and future levels when needed. **[4]**

The creation of an ET in mathematics should address the humanities and universal values as much as possible paying attention to distance learning the student cannot interact directly with the teacher. The introduction of humane material from mathematics into ET is the physiological structure of the brain, allowing the left hemisphere of the brain to rest and move to the right hemisphere. In this way fatigue is prevented during the training and as a result the efficiency of learning the material increases. In addition to the material studied, the reference to the ideas and aphorisms of ancient philosophers, as well as the values of Eastern thinkers increases the interest of students in the science of mathematics and contributes to the overall spiritual development. In addition, it is necessary to provide educational content to the structure of the didactic system of ET. Within the module, the process of teaching mathematics on the basis of ET can be organized

on the basis of programs known today as linear - iterative, network or a combination of them. The process of computer-based learning is carried out in a spiral sequence from the lowest to the highest level through the active use of knowledge, skills and abilities acquired in the early stages of teaching. Initially, basic knowledge of mathematics is imparted and at subsequent levels new knowledge is focused on the formation of skills to apply them to solve problems independently and with the help of computers **[5].**

In order to carry out this process it is necessary to distinguish concepts and features of being studied. It is necessary to know whether there is a connection between the acquired skills. The issue of data collection (knowledge) and its operative use has a great importance when information is increasing day by day nowadays.

The following models are available for easy data collection and usage of it :

• Logical model (writing mathematical expressions in symbols);

• Frame model (classification and systematization of data in the form of tables, matrices, etc.);

• Productive model (algorithmic instructions and rules for solving tasks);

• Semantic model (representation of data in the form of fractions, block diagrams).

Traditionally, educational materials are presented in a compressed form that the information is made in four codes at the same time (consisting of pictures, numbers, symbols and words) furthermore didactic effect is done through multimedia tools that is created by multisensory changing environment in ET study The methodological power of multimedia is that in the visual presentation of material both auditory and visual perception of information can affect students' emotions and make it easier to understand. Everyone's learning style is different, some people absorb information by hearing, others by sight, and the others by hearing and sight at the time.

Multimedia to make it possible to choose the most appropriate teaching method for a particular subject combining the features mentioned above. Learning material through exposure to the senses is more effective than traditional teaching methods. ET is an intensive form of teaching information through audiovisual tools. The didactic material prepared by the experts focus on the individual abilities of the students.

The following is an algorithm based on the teacher's linear-iterative scheme. This teaching method consists of:

• watch and listen to short theoretical material synchronously;

• explain the tasks and perform them sequentially using diagrams;

• Automatic monitoring and evaluation of knowledge in the form of "questionnaire ".

An automated system for controlling the acquisition of knowledge, skills and competencies in an e-textbook can consist of a variety of algorithms. Practice has shown that the positive effects of the computer appears in the fulfilling to prove the basic concepts of mathematics, to prove its complexities, to explain formulas and phrases, to organize research, to do exercises, to self-monitor, evaluate, diagnose mastery, and so on

The use of e-textbooks in the teaching of mathematics improves students 'mathematical outlook, saves time furthermore improves students' mathematical practical knowledge.

**REFERENCES:**

1. Farberman VL, Musina RG, Jumabayeva FA. Modern methods of teaching in higher education. Tashkent: "Teacher"; 2000. p. 15.
2. Fayziev MSh, Jumaev SS, Majidov ShA, Sadikova DA. Positive aspects of interactive learning methods. Academicia an International Multidisciplinary Research Journal. 2021;11(4): 1271-1276.
3. Jurakulov TT, Utapov TU. Methods of creating an electronic educational complex on the subject of pedagogical web-design with the help of Namo web-editor. Master's dissertation - Navoi . 2015. pp.25-29.
4. Podlasy IP. Pedagogy. New Course Book 1. Moscow: "Vlados"; 2000.
5. Ashurova DN, Jumayeva NF, Toshtemirova KE. The role and importance of innovative software and didactic complexes in increasing the effectiveness of training. ACADEMICIA: An International Multidisciplinary Research Journal, 2021;11(1): 871-875.