TASHKENT MEDICAL ACADEMY

100 TMA ANNIVERSARY

Journal of Educational and Scientific Medicine

Issue 3 (2) | 2022

OAK.uz
Supreme Attestation Commission at the Cabinet Ministers of the Republic of Uzbekistan
Google Scholar

ISSN: 2181-3175

Journal of Education & Scientific Medicine

ISSN 2181-3175

Tashkent Medical Academy

Research Article

Open © Access

SMART TEXTBOOK - a New Level in the Modern Educational Process

A.O. Okhunov[1]

[1]*Professor, MD, PhD, Head of the Department of General and Pediatric Surgery of Tashkent Medical Academy, Tashkent, Uzbekistan*

Abstract

We are all already accustomed to computer technology, using them in everyday work and domestic needs. Today, smart technologies are actively used, in the form of mobile phones, tablets. The process of reading books by means of such electronic media and converters has significantly intensified. Given such a relevant vision in this knowledge, we tried in this article to show not only the relevant aspects of using smart textbooks, but also the technical aspects of its creation, organization of work and, of course, the positive and negative sides that can be encountered on the way of each author.

Corresponding author: Alisher Oripovich Okhunov - Professor, MD, PhD, Head of the Department of General and Pediatric Surgery of Tashkent Medical Academy, Tashkent, Uzbekistan e-mail: general-surgery@mail.ru

Received: July 28, 2022, **Accepted:** July 30, 2022, **Published:** September 05, 2022

Keywords: Smart textbook, educational process, study, cognition, technology, digitalization

Among the well-known main functions of modern smart textbooks, it is considered to provide as a source of educational information that reveals the content provided for by educational standards in an accessible form for students. Today, when the distance learning process is becoming an increasingly common form of obtaining knowledge, a smart textbook acts as a learning tool through which the organization, including self-education of students, is carried out.

Smart textbooks exist in the following forms: educational books and texts, anthologies, problem books, workshops, didactic manuals, books for additional reading, maps, educational videos, computer programs on CDs, databases on websites, etc.

The smart textbook reflects such mandatory learning stages as setting a task, presenting information, revealing ways to solve problems, generalization and systematization, consolidation and control, independent work.

The main components of the content of any smart textbook are: informative, reproductive, creative, emotional and valuable.

Each component has a specific composition and means of implementation in a smart textbook:

• The informative component is presented in the smart textbook using verbal and symbolic presentation, as well as illustrations (vocabulary, facts, laws, methodological and evaluative knowledge).

• Reproductive tasks focus on general educational, subject-cognitive and practical actions.

• Procedures for creative activity are set with the help of a problematic presentation, problematic questions and tasks, a collapsed text.

• The emotional and value component reflects the worldview, moral, practical, labor, ideological, aesthetic and other orientations. This is ensured by the brightness and descriptiveness of the presentation, the appeal to the life problems and personal experience of smart students, paradoxes and other means.

The main form of a smart textbook is text. The text of the smart textbook is divided into

main, additional and explanatory.

The main text, in turn, is divided into two components:

1. epistemological:

o basic terms;

o key concepts and their definitions;

o basic facts, phenomena, processes, events;

o experiences;

o description of the basic laws, theories, leading ideas;

o conclusions, etc.

2. instrumental-practical:

o characteristics of the main methods of cognition, rules for the application of knowledge, methods of assimilation and independent search for knowledge;

o description of tasks, experiments, exercises, experiments;

o compiling a set of tasks, experiments, independent work;

o reviews, sections, systematizing and integrating educational material.

Additional text includes:

- the documents,
- textbook material,
- an appeal to readers,
- biographical information,
- statistical information,
- reference materials outside the scope of the program.

Explanatory text includes:

- subject introductions to the textbook, sections, chapters;
- notes, explanations;
- dictionaries;
- alphabets;
- determinants;
- explanations for maps, charts, diagrams;
- pointers.

In addition to the text with educational material, the smart textbook contains the so-called extra-textual components: the apparatus for organizing the assimilation of material, illustrative material, and orientation apparatus:

1. apparatus for organizing the assimilation of material: questions, tasks, memos, instructional materials, tables, captions for illustrative material, exercises,

2. illustrative material: subject and plot materials, documents, technical maps, diagrams, diagrams, plans, drawings, instructions, methods, graphs, reference books, illustrations,

3. orientation apparatus: preface, table of contents, rubric, signals-symbols, bibliography, index, footer.

Unlike smart textbooks, electronic educational and methodological complexes are open systems of teaching aids that provide a student-centered level of education in a mass educational process. Today, educational and methodological complexes for some training courses can contain up to two dozen elements: a smart textbook, a task book, a book for reading, an reader, a workbook, a methodological guide, a work program, sets of test tasks, video cassettes, CDs, computer programs and etc.

The concept of a basic textbook in the modern higher education system has lost its former meaning in recent years. This is primarily due to the fact that since the early 1990s. the number of alternative or parallel textbooks on the same subject has increased significantly. Therefore, each teacher recommends to students those textbooks and manuals that best correspond to his own views on the curriculum, or develops his own textbooks and manuals.

When creating and using electronic learning tools, three main approaches can be distinguished: pedagogical, informational and student-oriented.

The pedagogical approach is based on the need to implement various didactic goals in the educational process (the nature of the representation of the surrounding reality, the organization of various types of educational and cognitive activities, the implementation of motivational, educational and control and corrective functions, etc.).

The information approach is aimed at creating a kind of learning environment in which, using certain pedagogical technologies, the process of cognition and intellectual development takes place.

The student-centered approach is aimed at the appropriate personality traits of students that develop in the course of specially organized activities.

Basic definitions of smart textbooks.

A computer textbook is a software and methodological complex that provides an opportunity to independently master a training course or a large section of it. A computer textbook combines the properties of an ordinary textbook, reference book, problem book and laboratory practice.

An electronic (computer) textbook should ensure the performance of all basic functions, including the presentation of theoretical material, the organization of the application of initially acquired knowledge (performing training tasks), control of the level of assimilation (feedback) without the help of any paper media, that is, only on the basis of computer program.

A smart textbook is a complex-purpose educational software system that ensures the continuity and completeness of the didactic cycle of the learning process: providing theoretical material, providing training activities and controlling the level of knowledge, as well as information retrieval activities, mathematical and simulation modeling with computer visualization

and service functions subject to interactive feedback.

Smart textbooks are primarily for the development of distance learning. The Internet makes it accessible from almost anywhere in the world. In addition, the smart textbook significantly enriches traditional forms of education, as it allows you to include a huge amount of educational and visual materials in it and contributes to the development of qualitatively new teaching methods.

The Smart Tutorial is essential because it:

• facilitates the understanding of the studied material due to methods of presenting material other than in printed educational literature: inductive approach, impact on auditory and emotional memory, etc.;

• allows adaptation in accordance with the needs of the student, the level of his training, intellectual abilities and ambitions;

• frees you from cumbersome actions, allowing you to focus on the essence of the subject, consider more examples and solve more problems;

• provides the broadest opportunities for self-testing at all stages of work;

• makes it possible to beautifully and neatly arrange the work and hand it over to the teacher in the form of a file or printout;

• plays the role of an endlessly patient mentor, providing an almost unlimited number of explanations, repetitions, tips, and so on.

The advantages of a smart textbook compared to traditional (printed) textbooks are:

1. **Possibility of filling with powerful visual aids.** A smart textbook is executed in a format that allows hyperlinks, graphics, animation, various active elements such as registration forms, test interactive tasks, and other multimedia features.

2. **Compact storage of huge amounts of information.** Smart books and other publications have significant advantages over their paper predecessors in terms of the quantity, variety and completeness of the information contained. So, on one CD-ROM disk with a capacity of 650 MB, about 4000 book volumes fit, which corresponds to a large home library!

3. **Ease of editing.** If the teacher has educational information in electronic form on his subject, he quickly rearranges it, makes changes and corrections.

4. **Availability.** The teacher can at any time place the entire textbook or its components and corrections on a web page on the Internet or on the educational server of the educational institution for simultaneous access to it by all his students.

5. **Interactivity.** Students, in turn, independently replenish such a smart textbook with their own work.

6. **Ease of handling.** The search system will help each user almost instantly "open" any material in such a textbook.

7. **Variation in execution.** A smart textbook can be given any form convenient for reading - background color, text color, font size; if necessary, using a printer, you can print out part of the textbook or publish it in the required edition in its entirety, arranging it at your discretion.

8. **Cheap.** The creation and design of a smart textbook, in principle, does not provide for special costs (except for the availability of a computer and the time to create it).

9. **Eternity.** If manuscripts, according to a well-known saying, do not burn (but, in any case, they smolder), then a smart textbook created in digital format is practically eternal, not afraid of wear and tear and aging.

10. **Mobility.** The smart textbook material can be quickly distributed by email, burned to a CD or placed on an educational website and on the Internet.

A smart textbook, being a multifunctional tool, is able to replace some of the traditional teaching aids.

Perhaps the only drawback of a smart textbook is the inconvenience of reading texts from the monitor screen, although any part of it can be printed at any time, as well as modern monitors and computer programs make reading from the screen more and more comfortable.

Basics of building a smart textbook.

The hypertext structure has become extremely widespread, mainly in information and reference systems in various fields of knowledge. Such programs provide electronic viewing of large volumes of hierarchically organized text and graphic information. The hypertext structure provides a quick search for information on various grounds. Hypertext is an information array on which links between selected elements are set and automatically maintained. Any weakly formalized set of texts or images can be represented as a hypertext. The hypertext form of information presentation is a consequence of the evolution of the means of communication between people, and hypertext corresponds to the nature of human thinking. Hypertext in a generalized sense is an interactive information system created on the basis of a variety of natural and artificial languages, flexible hardware and software that allow the user to dynamically and creatively interact with a changing information array in order to obtain new knowledge for themselves.

Hypermedia systems are also becoming more widespread. Hypermedia is a way of organizing multimedia. Multimedia involves combining several means of providing information in a computer system, namely: text, sound,

graphics, animation, video, spatial modeling. Hypermedia consists of nodes, which are the basic units of information storage and can include pages of text, graphics, sound information, a video clip, or an entire document.

Mutual coordination of the lecturer's voice, musical and noise accompaniment with the visual range can provide a figurative perception of educational material, an emotional impact on the student, which provides not only deeper and "long-lived" knowledge, but is associated with a much less strain on students' vision.

The user can develop his own route for searching for information in the array. He can not only choose one or another strategy for reading a single text, but also create a new text himself based on the fragments contained in the hypertext system. Hypertext has increased the role of the reader, turning him into a co-author and interlocutor. In addition to the dialogue between the reader and the author in the hypertext system, a polylogue of readers is also possible, since, following in the footsteps of the previous reading, each new reader not only masters one of the possible logics of co-creation, but can also contribute to the creation of the text.

The user in the process of studying each topic must decide which of the related topics he should go to for further familiarization with the subject. The wrong decision can lead to insufficient or incorrect understanding of the subject, the omission of essential information. Experiments have shown that often, due to active movement through a variety of topics, the user gets a false impression of complete assimilation of information with a very superficial acquaintance with it, or even with an incorrect interpretation of the content of the hypertext. In fact, for the correct expedient way of familiarizing yourself with the material, you must first know this material. This means that such a choice cannot be entrusted to a user who is only going to read this material. Recently, systems have appeared that have the function of choosing a trajectory that is rational for a given user for moving through hypertext. We are talking about intelligent hypertext systems that will identify the user's problem and outline the area of his information needs, select from the hypertext those nodes whose content corresponds to the user's information needs.

There are several classes or types of smart textbooks.

In terms of media and presentation of information:

• **online smart textbooks** - fully or partially presented on servers on the Internet/Intranet;

• **local smart textbooks** - usually recorded on CDs or other removable media and can be used either directly from the media or installed on a personal computer.

From the point of view of orientation to the educational process:

• smart textbooks, which for the most part repeat printed textbooks and are used for independent work of students in combination with traditional forms of education (lectures, seminars, tests and exams);

• smart textbooks, which include, along with texts and visualization, some interactive components and are used not only as a manual for full-time study, but also as an element of self-study of the course;

• smart textbooks for distance learning, almost entirely designed for independent study of the course and virtual communication with the teacher.

Creation of an electronic textbook.

To begin with, it is enough to be able to use a computer text editor and a scanner to create electronic and convert printed texts into electronic form. To create a full-fledged smart textbook, it is recommended to use a team consisting of the course author, programmer, designer, methodologist. Depending on the complexity and volume of the smart textbook and the timing of its creation, the team can be increased or, conversely, reduced. If the author of the course is an advanced computer user, then he can do all the work of creating a smart textbook himself.

A computer and a scanner are enough to create an intermediate-level smart textbook. However, the development of complex multimedia applications may require a video camera, microphones, special programs for digitizing audio and video, etc. In addition, if the final execution of the Smart Tutorial is to be on a CD, a device will be required to burn it, and if it is to be placed on the Internet/Intranet, a connection to the server and appropriate programs to use its components on the server.

As a rule, textbooks made in html format, the main format of the Internet, are the easiest to manufacture and use. This allows you to use the smart textbook and its individual materials for placement on the educational server of the educational institution and use it in the distance learning system.

The simplest, most accessible and common program for creating an electronic textbook is MS Word. This program allows you to create hypertext and include pictures, diagrams, tables, etc. in it. In addition, MS Word allows you to save files in html format, which makes it possible to use them on the Internet/Intranet.

A more effective program for creating bright and visual smart textbook components, including multimedia applications, is the MS Power Point presentation program. Presentations can

also be saved for online use. In addition, they can be used when conducting face-to-face classes with students.

However, the most convenient tools for creating hypertexts with the inclusion of visual, interactive, software, multimedia and other components are HTML editors. They allow you to prepare files that are most suitable for use on the Internet/Intranet. One of the quite convenient and easy to use is Macromedia Dreamweaver.

Fixing the methodological foundations for designing a smart textbook begins with determining the type of education and the basic educational (didactic) system in which training is planned. The next stage is the educational standards of various levels, which are (should be) part of any educational system and the smart textbook being created. All other elements and forms of presentation of the content of education - curricula, methods, anthologies, problem books, workshops, dictionaries, educational videos, didactic manuals, computer programs and databases, are derivative, but not defining methodological elements of building a smart textbook.

In addition to the components of a regular textbook, as well as illustrations and multimedia, a smart textbook should include a variable and invariant part.

The invariant part includes fundamental educational objects and, indirectly, the main technologies of activity that students must master while working with a smart textbook. Fundamental educational objects are real and ideal entities, concentrating in themselves the cognitive and educational area (to a certain extent, these are the foundations of educational standards established on a scientific and pedagogical basis). Activity technologies are usually expressed by the structure of educational material, the forms and activities of students offered in a smart textbook, the features of the proposed tasks, the hypertext capabilities of interconnected pages, etc.

The variable part of smart textbooks is the content of this textbook designed by a teacher, administrator, educational institution, students or other learning subjects. For example, as a technological basis for a variable part of a smart textbook, a database can be structured in a certain way. The variable part also includes educational products individually created by students.

One and the same smart textbook can have different versions - for a teacher (educational institution) and for students. From the point of view of a teacher, a smart textbook on a particular subject has been constantly supplemented with new texts by students and specialists in the form of additional applications for 2-3 years. The textbook "grows" in volume in the number of its applications, interconnected by hyperlinks. After some time, its individual parts and applications are processed.

For the student, his textbook is supplemented by personal work, the work of his fellow students and the texts of the primary sources that he chooses for himself. Such a textbook remains in the archive of the student and accompanies his personal education throughout the years of study. As a result, each student creates a personal educational library stored on a computer or on CD-ROM disks.

The form of the electronic textbook should be block. This means that individual blocks can be replaced, added or changed during the course of training. Unlike "paper" textbooks, the replacement of electronic components does not involve significant costs for reprinting.

The content of each individual block of the smart tutorial includes:

1. section or topic containing educational material grouped around fundamental educational objects;
2. a set of key problems on a given topic of various types and purposes: scientific solved and unsolved problems, educational, organizational, technical and other problems;
3. the best works of students of past years, along with texts-primary sources of scientists and specialists on the same topics;
4. new works of students, the best of which are selected and included in the form of separate parts of the block under study;
5. tasks and exercises for students of the following types:

o anticipating the study of the section, introducing a range of issues;

o on drawing up an individual program of classes for the section;

o aimed at creating personal creative results on key issues;

o to compare their work with analogues;

o for the assimilation of educational standards;

o providing the necessary training and consolidation of the material;

o to perform individual and collective creative work;

o on awareness, analysis of activities and results;

o on self-assessment of work.

The accumulation of materials to fill a smart textbook for a full-fledged training course can take years. First of all, these are electronic texts of the teacher, created by him in preparation for classes. Then - scanned materials from various publications used in the educational process. Finally, materials gleaned from the Internet. Added to this are the individual works

of students who fill the smart textbook already in the process of using it in the educational process.

Unfortunately, there is a widespread misconception in the educator community that once you give a programmer the learning material of a traditional course of lectures or sets of traditional learning tasks, all the benefits of a smart textbook listed above will manifest themselves. Such a view is erroneous. A purposeful activity of developers is needed in order for the high potential pedagogical possibilities of a smart textbook to become a reality.

It is best to organize this kind of work and carry it out as a project. A typical smart textbook project might include:

- project manager
- course author
- programmer
- Methodist
- designer

After the smart textbook is introduced into the educational process and is tested at the final stage of the project, a curator and a teacher participate in it.

The main stages of working on a smart tutorial are as follows:

- Choice of sources
- Conclusion of agreements with authors on the right to processing
- Development of a table of contents and a list of concepts (index)
- Processing of texts into modules by sections and creation of Help
- Implementation of hypertext in electronic form
- Development of computer support
- Selection of material for multimedia implementation
- Development of sound accompaniment
- Realization of sound accompaniment
- Preparation of material for visualization
- Material visualization

For the authors of the educational electronic edition, the following scheme of work can be recommended:

1. Construction of a theoretical model of the content and a model for the development of educational material.

2. Preparation of the text material of the publication, including figures, diagrams, diagrams, tables, illustrating and supplementing the main text.

3. Development of a scenario for the student to work with the material.

4. Dividing the material into articles, using two methods.

a. Splitting from top to bottom, in this case the order of work is as follows:

 selection of articles containing the most general information (according to the table of contents);

 selection of articles from the material, gradually detailing the articles of the previous level (link is carried out by keywords or expressions);

 if necessary, reference articles are added to the dictionary of the textbook.

b. Splitting from bottom to top, in this case, the order of work is as follows:

 selection of the vocabulary from the textbook material;

 selection from the general material of those articles in which a fixed concept occurs;

 writing additional articles based on already prepared articles, terms and definitions from the dictionary of the textbook;

 detailing the material of the table of contents.

Splitting from top to bottom is usually carried out quickly, but it does not guarantee the independence and completeness of the material at all levels of splitting. Partitioning from the bottom up gives such a guarantee and requires a lot of time from the author.

5. The choice of routes for studying the material (the route sets the sequence for studying individual articles). The route can be fixed or chosen by the trainee, depending on the degree of preparedness.

6. Drawing up methods for controlling knowledge on the subject. When creating methods, it is necessary to pay attention to the definition of corrective routes.

7. Drawing up a general block diagram of a hypertext tutorial.

8. Drawing up examination questions and tests for self-control and rating control.

You can propose the following scheme both for creating a smart tutorial and for testing ready-made components:

GENERAL INFORMATION ABOUT THE TEXTBOOK AND ITS SECTION

1. The name of the smart textbook, the total number of hours to study it.

2. Why this tutorial is needed by its developers.

3. Who is the textbook for?

a. status

b. age range

c. educational qualification

d. user geography

e. specific requirements for the level of training of students

f. other characteristics of textbook users

4. The name of the section of the smart textbook, the total number of hours to study it.

5. Why and why will students need this section? What is its role in smart textbook?

6. Does the developed section of the smart textbook have an analogue. Who are its au-

thors. What does the smart textbook developers have to do with the full-time version of the section.

7. If there is a full-time version of a section (topic), what are the main problems of its "translation" into an electronic version:

- meaningful
- structural
- pedagogical
- organizational
- technical
- other

PEDAGOGICAL FOUNDATIONS FOR DESIGNING A SECTION OF A SMART TEXTBOOK

1. IDEA.

2. MOTTO, quote, introductory task or other title form of the beginning of the section.

3. OBJECTIVES OF THE SECTION (TOPICS):

a. The objectives of the section regarding students.

b. The objectives of the section regarding the teacher.

c. Shared goals for teacher and students

d. The goals of other learning subjects in relation to this section

4. SECTION TYPE smart textbook

a. theoretical

b. problem

c. laboratory-practical

d. research

e. communicative

f. control

g. generalizing

h. innovative

i. different

5. BASIC PEDAGOGICAL TECHNOLOGIES FOR MASTERING THE SECTION of a smart textbook

a. laboratory-practical system;

b. design system;

c. tutor system;

d. heuristic distance learning technology

e. and etc.

6. CONTENT OF THE SECTION

a. A list of key educational problems (questions) of the section with an indication of the expected number of hours for their development by students.

b. The list of the main activities of the student in the study of the section.

c. Names of primary source texts on the topic of the section that will be included in it for study.

d. Links from the network on the content of the section. Other additional materials.

7. ASSIGNMENTS AND EXERCISES FOR STUDENTS. Formulate several tasks of the following types:

a. for the implementation of your chosen didactic functions of smart textbooks;

b. on the assimilation of educational standards;

c. providing the necessary training and consolidation of the material;

d. on drawing up an individual program of classes for the section;

e. aimed at creating personal creative results on the key issues of the section;

f. to compare their works with cultural and historical analogues;

g. to perform individual and collective creative work;

h. on awareness, analysis of activities and results;

i. for self-assessment of work.

8. TYPES AND FORMS OF LESSONS FOR THE DEVELOPED SECTION of the smart textbook.

a. Types of distance learning

b. Types of self-education

c. Other forms of classes recommended in the study of the section.

9. SYSTEM OF CONTROL, EVALUATION AND CERTIFICATION OF LEARNING RESULTS UNDER THIS SECTION.

TECHNICAL AND OTHER TRAINING TOOLS

1. Computer platform

2. Required student software

3. Telecommunications learning environment

4. Types and forms of presentation of accompanying educational materials

ORGANIZATIONAL FEATURES OF STUDYING THE SECTION OF THE SMART-TEXTBOOK

1. Teaching, technical and administrative staff.

2. The need for databases.

3. A brief description of the basic procedures for creating a smart textbook section.

4. Financial basis for the subsequent development and implementation of a smart textbook.

The issues of protecting smart textbooks from illegal copying require a special solution in each specific case, depending on the conditions for financing its development and the order of distribution.

There are several options.

First, copyright, which keeps law-abiding citizens from unauthorized copying of smart textbook materials.

Secondly, software tools: encryption and encoding of files, which can then be opened only with the help of keys and passwords. In network versions, access to smart textbook materials is also provided with a password.

Thirdly, regular processing and revision of smart textbooks, which makes it impossible to use it in the same form in the next academic year.

Conflict of interest - none.
Funding - no.

Bibliography:

1. Okhunov, A., Khudaiberganova, N., Kasimov, U., Atakov, S., Bobabekov, A., Boboev, K., & Abdurakhmanov, F. (2022). Optimization of the educational process at the department of general surgery. Journal of education and scientific medicine, (1), 98-101. Retrieved from https://journals.tma.uz/index.php/jesm/article/view/303
2. Okhunov, A., Khudaibergenova, N., Atakov, S., Bobabekov, A., & Kasimov, U. (2022). Role and place of technologies webinar in cooperation of the educational process of the branches of the Tashkent medical academy. Journal of education and scientific medicine, (2), 73-76. Retrieved from https://journals.tma.uz/index.php/jesm/article/view/278
3. Okhunov, A., Khudaibergenova, N., Atakov, S., Kasimov, U., Bobabekov, A., Boboev, K., & Abdurakhmanov, F. (2022). New pedagogical technologies in teaching surgery. Journal of education and scientific medicine, 1(3), 8-11. Retrieved from https://journals.tma.uz/index.php/jesm/article/view/316
4. Tuychiev L.N., Okhunov A.O. Innovations in the cooperation of the educational process of the branches of the Tashkent Medical Academy. Proceedings of the 2nd International Educational Conference "Current State, Problems and Prospects of Medical Education", 2019/4/12-261-262