

DIGITAL HANDBOOKS OVERVIEW OF AVAILABLE OPTIONS

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***Abstract:** This article presents the present author's modern concept of e-textbooks. The modern e-textbooks proposed by the author have a layered structure. Educational spaces are made up of any number of multimedia and interactive elements that can be freely composed by creators and teachers. In addition, an e-book can be played on different types of mobile devices, which also corresponds to the rule of knowledge on demand*

Keywords: e-learning, e-learning platform, digital handbook, e-books, multimedia.

INTRODUCTION

In many European countries, including Poland, there is a debate on the introduction of e-textbooks to schools. This issue is being analyzed in both essential (usability, range of using, pros and cons) and economical (cost of introduction and support) areas. The debate is an effect of on-going digitalization of our lives. In many European countries, the idea of e-textbooks is being processed at a decision stage, not to mention the countries which have already implemented it in schools. The presented information describes the actual situation in Europe, based on the data from the Ministry of National Education – Euridice Polish Office.

In France, the project similar to “Digital School” is in its pilot phase. The French Department of Education has tested the usability of e-textbooks since 2009. This year, the experiment will cover about 20 000 pupils and their teachers in high schools. In the process of developing new solutions, the Department cooperates with publishers, online educational platforms, and ICT tools producers. The program is sponsored by local authorities and central government institutions. E-textbooks are being prepared for courses like History, Geography, and French language. They include a lot of graphics, audio and video add-ons. The teacher has access to an administrative panel, which allows to choose elements included into classes. Pupils can use materials in many places via the Internet– at home, at school, libraries – everywhere they have access to computers (their own, supplied by school or local

authorities in the project). E-textbooks are not available at traditional publishers' market.

In Sweden, there is no central system of verification and acceptance of textbooks by the Ministry of Education. It is the teacher who decides on using educational materials. It is his decision whether to use traditional books, electronic materials, or not to use any of them during classes. On the other hand, there is a wide-ranging discussion in Sweden on e-textbooks, caused by authorities of one of schools in Sollentuna region. Children in this school learn to read and write using tablets until the age of 8. This idea has been criticized by the Ministry of Education, and widely on the Internet, but the school is determined to continue the project, and assigned the equivalent of 6 000 000\$, which balances financing traditional paper books in this school.

In Finland there is a system which is similar to Swedish one. Teachers decide which materials they use in their lectures. There are e-textbooks available, which have been created mainly for students with special educational needs.

The situation in Great Britain is a reflection of the one in Scandinavian countries – teachers are to choose materials by their own. And same as in Scandinavia, there is no official record of using e-textbooks in education. However, in 2010 the national research institute Becta conducted an interesting study which showed that more than 50% of teachers regularly use online educational materials and give home assignments based on these resources.

In Portugal, Belgium (French regions), Scotland and the Czech Republic there dominates the traditional textbook market, though some teachers use educational materials available on the internet.

In Slovakia, in 2010 the Ministry of Education inaugurated the *eAktovka* program. Its aim is to create an educational portal with books and other educational materials, including video and audio version. Since January 2012, the users have been testing the portal, and the ministry is buying licenses allowing for publishing books on the portal. The ministry wants all the resources necessary for learning at all levels of education to be available at the platform in the future, although it is difficult to predict the opinions of the editors in this case. A similar pilot program is carried out in Austria.

In Iceland in schools at primary level there are two pilot projects, including one for students aged 14 and 15 years. First of all, the program checks the potential of tools such as the Kindle and iPad. In this country, educational materials via the Internet are widely used, supported by wide access to the central database and a schools' network.

Greece, thanks to the European Union funds, also launched a *Digital School* program. It involves spreading e-books, equipping the studio with modern equipment and educating teachers in the use of new technologies. E-books are

construed as traditional manuals in pdf. At present they are spreading and are used since the first grade of primary school.

In Lithuania publishers are encouraged to create digital versions of resources, although they are reluctant to do so. Existing e-textbooks are used only at the stage of primary school. Lithuanians emphasize that e-books are still functioning in parallel with traditional books, adding the fact that the first e-book without the paper counterpart will soon become available on the market, designed for learning the Lithuanian language by ethnic minorities.

In Cyprus, the majority of textbooks is present on the market in both pdf and traditional version. In 2012, the Ministry of Education sent a part of such digitized books to secondary schools and vocational schools. In March 2012, some schools have launched a program in which the students bring their laptops to school once a week. By the end of the school year, teachers will develop recommendations and proposals for lesson plans using laptops in the classrooms.

In Bulgaria, a new bill on the education system has been prepared, aiming at systematization of the use of electronic books. But it is not planned to implement them as an independent and unique resource - the schools will still apply traditional printed books, and all e-resources will be regarded as complementary.

Latvia uses primarily traditional textbooks, and electronic materials are auxiliary. Teachers are encouraged to use the e-resources, especially in classes with physics, chemistry and biology. But ultimately it is the teacher who decides on the type of textbooks. In addition, the National Center for Science Education approved electronic educational materials about the European Union, which can be used in lessons of Social sciences, History, Ethics and Geography.

In Italy, they use textbooks, which are available either in an electronic form only, either traditional and electronic. The Ministry of Education provided the technical requirements of the publishers of such resources, so that their use is standardized.

In Spain, despite the lack of regulations on e-books, and of the lack of statistics of using new technologies, autonomous regions implement education programs aimed at digitizing school reality. In Andalusia, in the school year 2011/2012, a pilot program was implemented for primary and secondary schools, which was attended by 90 schools. They developed the concept of digital resources and planned to use them during the lesson. In Catalonia, *EduCAT* program for 10 - and 12-year-olds was developed, which equipped pupils with a computer infrastructure and e-books.

In Slovenia, like in Poland, the manuals must be approved for use in schools by the central functioning expert council. The use of particular textbooks in the classroom is possible after consultation with parents. The first e-textbooks were approved in November and December of 2011, so their use is not yet popular. Approved for use, e-textbooks have been prepared for the activities of environmental education in the first three grades of primary school. In the sixth, seventh, and eighth grade students

can enjoy the e-textbooks during lessons of art and technology. Interestingly, these e-books do not have their traditional equivalent books¹.

The above results of the research by the Polish Ministry of Education present a variety of concepts of e-textbooks in European environment. They show a multitude of e-textbook definitions, from the digitized form of traditional book, coming from the 1:1 transfer of the traditional book to digital to more elaborated ones including parallel operation of two types - e-book media, compatible with the traditional, but going beyond it by possibilities of instructiveness and multimedia available from various carriers. A third possibility - according to the results of MEN - is e-book independent of the traditional textbook in terms of program, as well as multimedia and interactive qualities. Facing the multiplicity of the concepts of creating e-textbook, the question is: what should the Polish e-textbook be like?

1. REVIEW OF E-TEXTBOOKS

Modern publishers and technology companies offer a variety of solutions for e-textbooks. This diversity is the result of the subsequent interpretation of the e-handbook and diverse understanding of the needs of teachers and the educational market. Some available solutions were established a few years ago, for example in academic centers, and is adapted to the current needs.

To update the issue, the following criteria for evaluating the concept of e-textbook have been taken into consideration:

1. Multimedia - Equipment Manual in multimedia elements such as videos, animations, simulations.
2. Interactivity - the handbook containing elements of active use, such as running interactive quizzes, experiments that provide interactive results, etc.
3. Availability from various devices - the ability to play your textbook and/or its fragments from a device such as a computer/laptop/netbook, tablet, interactive whiteboard.
4. The ability to print content/e-textbook passages - to print any part of the materials, for example, indicated by the teacher part of an e-book.
5. Integration with e-learning platform - the opportunity to publish an e-textbook on e-learning platform, and thus gain access to information on the results of the use of both whole textbook and its parts.
6. The integration with the educational and/or social portal - availability of e-textbook from educational portal from anywhere at any time, with the possibility of expanding e-textbook with additional materials, such as links to the latest developments with the use of social and communication channels.

¹ Source: *E-podręczniki w Europie*, <http://www.men.gov.pl>
(full link: http://www.men.gov.pl/index.php?option=com_content&view=article&id=3191%3Ae-podręczniki-w-europie-&catid=97%3Aksztalcenie-i-kadra-edukacja-informatyczna-i-medialna-default&Itemid=134).

7. Correlation with a traditional textbook – program and content in line with traditional, paper version of handbook.
8. Ability to do self-control, self-assessment and self-verification tests straight from the e-textbook.
9. Navigation – ability to navigate through the textbook, in either linear or random form.
10. The ability to create the content of textbook with resources available in e-books or from their own teaching materials for any batch of material, such as a lesson.

As a result of the analysis of the criteria e-textbook must meet, and within the available solutions on the market, the following summary has been developed.

Table 1.

Typology of available e-textbooks

<p>Static e-textbook</p>	<p>Idea: Transforming the traditional manual into an electronic format</p> <ul style="list-style-type: none"> •Static - mostly in pdf format •It is the traditional textbook 1:1 mapping •Has the ability to print •Has the ability to place it on the e-learning platform, without tracking the use of e-textbook at the level of its parts
<p>Multimedia enhanced static e-textbook</p>	<p>Idea: Transforming the traditional manual into an electronic format, a simple, quick publication of educational resources</p> <ul style="list-style-type: none"> •Static - mostly in pdf format •It is the traditional textbook 1:1 mapping, frequently with traditional pages layout •Built on a conceptual level as static material •Enhanced with multimedia •It has poor, mostly linear navigation •Has the ability to print selected parts •Has the ability to place it on the e-learning platform, without tracking the use of e-textbook at the level of its parts
<p>Multimedia e-textbook</p>	<p>Idea: Creating a fully multimedia textbook at the level of concept</p> <ul style="list-style-type: none"> •Has the ability to place it on the e-learning platform, with tracking the use of e-textbook at the level of its parts or as a whole •Has stepwise navigation •Constructed completely multimedially, including the division of content, graphics and multimedia case •Enriched with advanced multimedia elements, animations, simulations, etc. •Has the ability to print selected parts

Interactive e-textbook	<p>The idea: To create completely multimedia textbook already at the level concept</p> <ul style="list-style-type: none"> •Has the ability to place it on the e-learning platform, with tracking the use of e-textbook at the level of its parts or as a whole •Has stepwise navigation •Designed interactively, divided into layers of substance and multimedia •Ensures implementation of interactive exercises •Provides ongoing cooperation of user with textbook •It creates the possibility of placing textbook on the educational / social portal •Allows using the textbook from multiple devices
Intelligent e-textbook	<p>Idea: Provide teachers with a flexible tool with which one can build own lessons content based on available resources, with the ability to use the basic version or modifiable</p> <ul style="list-style-type: none"> •Has the ability to place textbook on e-learning platform, with the option to track the results of its use (the use of the textbook or any of its parts) •Gives the ability to modify the basic version by changing the layout and sequence of content, complementing additional materials, including own materials •Ensures implementation of interactive exercises •Provides ongoing cooperation of user with textbook •It creates the possibility of placing textbook on the portal educational / social •Allows the use of the textbook from multiple devices •Gives ability to print selected parts •Built-in stepway navigation •Designed interactively

Source: own work, Marlena Plebańska

As the above analysis shows, there are many opportunities to develop e-textbook, ranging from static solutions which are mostly digitalized version of the traditional textbook, to the intelligent material that gives teachers the possibility to select the content of the lesson, with the use of resources library, which can also be used to create multi-course lessons. In Poland, the most frequently used solution is intermediate, such as multimedia e-book. Advanced multimedia textbooks are still very rare. There is also a lack of knowledge on modern technological solutions available among textbooks creators.

So, what should an ideal e-textbook be like? Unfortunately, there is no such thing as an ideal e-textbook. Electronic textbook, according to very short lifecycle, is usually up to date for 2-3 years. And while the content usually remains valid, technology used becomes outdated. New materials, more interactive, more multimedia, appear on the market.

2. PROPOSITION OF E-TEXTBOOK MODEL.

In the construction of e-textbook it is difficult to give a final judgment, because the models become outdated as quickly as the tastes and needs of consumers. And although it might seem that the Polish school is quite numb as an institution, the community of teachers and students are increasingly discovering the need for interactive content available from anywhere, anytime. Therefore, the model tailored to current needs is presented in Figure 1.

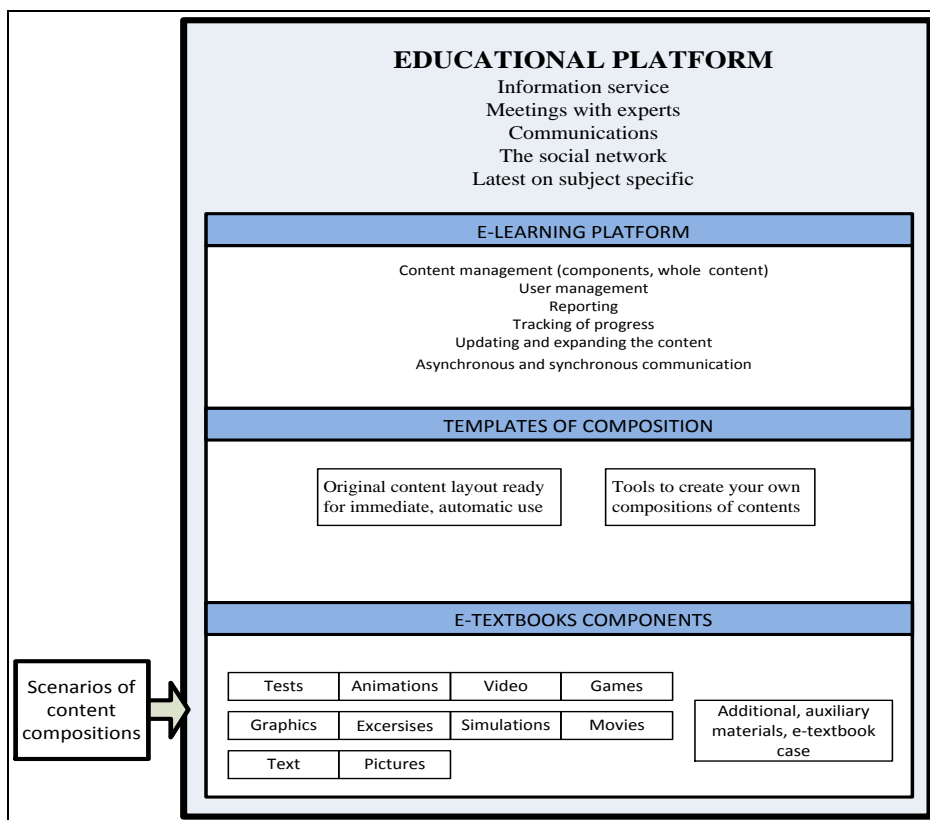


Figure 1. Proposition of author's e-textbook model

Source: own work, Marlena Plebańska

This proposal is based on the concept of placing an e-textbook on an e-learning platform coupled with an educational portal. This type of access to textbooks allows you to use them from anywhere, at any time, from different types of devices with just a browser. In addition, it ensures the implementation of all processes typical of educational portals: the creation of an information service, all the latest news of subject, meetings with experts, communication, social contacts. The connection of an educational portal with an e-learning platform gives you first of all an opportunity to observe not only the use of the textbook, but also its parts. It also provides an opportunity to implement the processes typical of e-learning platforms, such as user

management, management of content available on platform, reporting, updating and expanding the content, synchronous and asynchronous communication.

The presented concept assumes that the e-learning platform e-book is available in the basic version, ready for automatic use, closing an arrangement of chapters and lessons. But it can also be suitable for immediate use as components (text, video, graphics, animation, audio, exercises, games, etc.) from which the teacher can independently create their own lessons, including multi-subject ones. If the teacher lacks certain elements, he can create them himself using a simple tool. Content of the e-textbook is based on system of scenarios of components and program content, proposed by the author as the original. Both the use of ready-made lessons and creating their own offers great opportunities for teachers to adapt the content to the needs - the specific target group, and preferred methods and techniques of driving lessons. It also offers possibility of rapid updating and continuous improvement to textbook as necessary, for example if you change the core curriculum.

3. MODERN E-BOOK - CONCEPT

The e-textbook concept assumes that the e-manual is composed of three levels synchronized with each other. The first layer is a repository that consists of three basic parts:

- **Global repository** – here are stored various globally available components of e-textbook, divided into categories.
- **Own repository** - here are stored components of e-textbook, which have been prepared by teacher. These components are also divided into categories.
- **Textbook casing** - here are stored additional, optional casing components of e-textbook, which have been defined for subject or age group.

The core repository consists of components of the content. The main types of components of contents in the e-textbook are:

- Texts
- Graphics
- Animations
- Simulations
- Movies
- Exercises
- Games
- Tasks Test

The second level of e-textbook are content interfaces, from which the users of e-textbook, mainly teachers and students, will be able to use the standard content

recommended by the e-textbook authors. It is important to ensure individual learning process and adapting the e-textbook to tutor's teach cycle. In this model, the teacher will be able to implement his own contents and components to e-textbook, and then create their own layout of the content of e-textbook containing both components prepared by the creators of e-textbook as well as their own.

The third level of e-textbook is content management environment for e-textbook and its users. Using the functionality available in the environment, teachers will be able to create virtual classrooms in which they will work in a virtual space with their students, based both on the e-book and a number of features to support its use, such as: synchronous and asynchronous communication channels (such as forum, chat, webinar), system of reporting performance and efficiency of student work, calendars, mailing lists, news service, group work, etc.

Suggested scheme of e-textbook is presented in Figure 2.



Figure 2. E-textbook scheme

Source: own work, Marlena Plebańska

The first level of repository is the base of content components that are dynamically retrieved by a second layer - interface - form the core content of an e-book. The content created by the authors of the second level also goes into the repository. The contents of an e-textbook case are used by teachers in any way using their dynamic availability at the interfaces level, compatible with the chosen by teacher standard layout or his own content. At the third level, teachers dynamically build virtual classrooms for their students, as well as a communication system, a method for monitoring the work processes and evaluation, on the basis of the available functions. All three levels of e-textbook are closely linked on the technological and utility level, which is demonstrated in Figure 3.

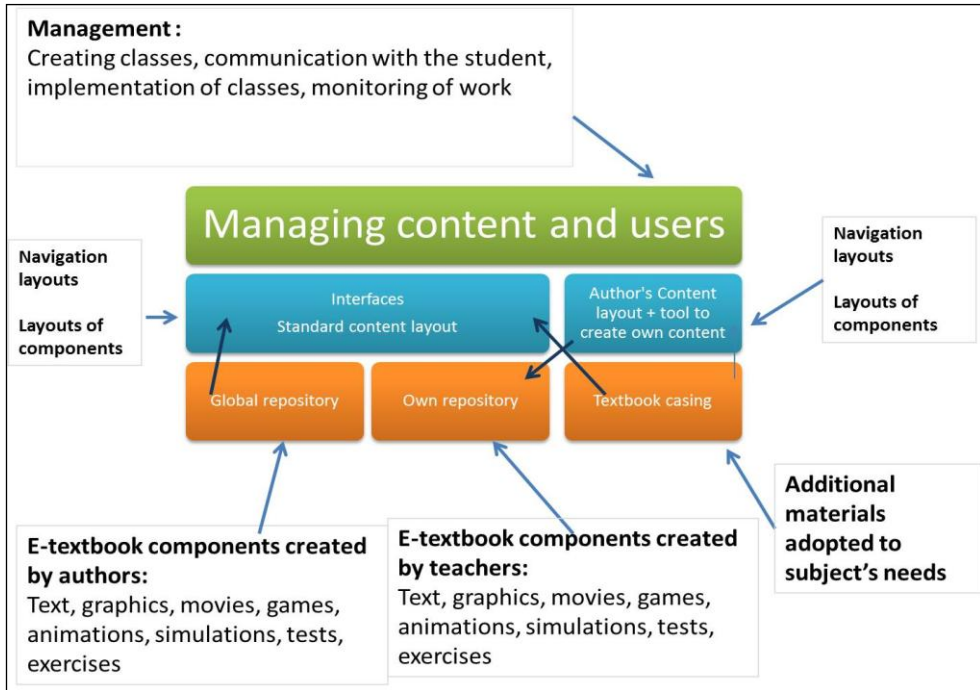


Figure 3. Diagram of cooperation between the different layers of e-textbook

Source: own work, Marlena Plebańska



Figure 4. Availability of e-textbook levels scheme

Source: own work, Marlena Plebańska

Not all the levels of e-textbook are visible to everyone. The first level of the repository is directly available only to the authors and editors of e-textbooks. However, the results of their work, that is produced educational content in various

forms of multimedia, are available for users (mainly teachers and students) at the level of interfaces as standard and / or copyrights components of an e-book.

Figure 4 shows the availability of e-textbook levels for key target groups of its customers.

E-textbooks may be used in different ways. The basic form of usage is online work with an e-textbook which is accessible from various devices such as PC, laptop, netbook, tablet, phone, board multimedia e-book reader, etc.. via a web browser. Moreover, in schools where the Internet is slower, teachers and students can download the textbook at their own equipment and work with it in the offline formula. Taking into account the preferences of today's students, e-textbook will also be available as a native app or a free app available on the android system, ios, Win 8, from the students' favorite places such as Android Market, the App Store or iTunes U. Teachers and students will be able to print any e-textbook items at their discretion.

Figure 5 presents possibilities of using e-textbooks.

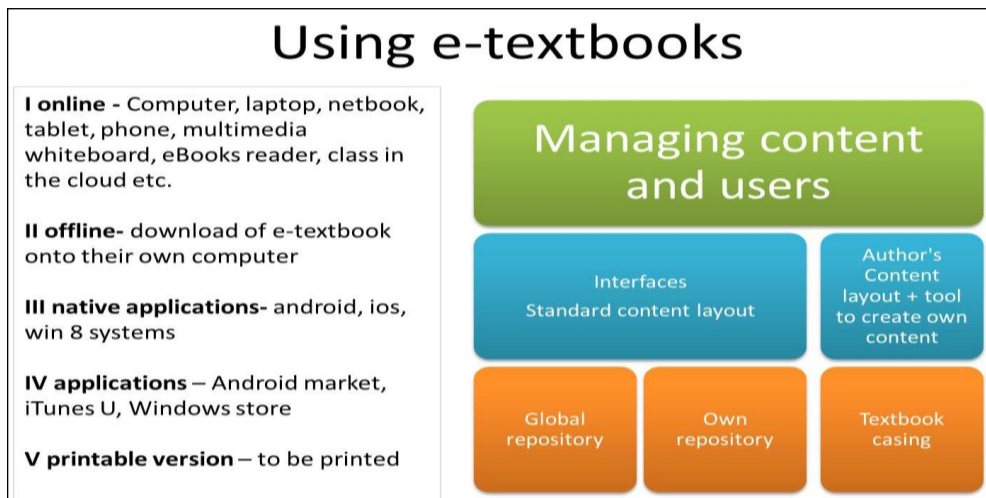


Figure 5. Possibilities of using e-textbooks

Source: own work, Marlena Plebańska

CONCLUSION

The presented possibilities of the e-textbook demonstrate a broad perspective it is perceived and the way to use and develop it by teachers. Although the concept of e-textbook was based on consideration about the needs of the school learning environment, it can be successfully used in the academic or business groups, because it is flexible and adaptable to different environments, taking advantage of easy adapting to many kinds of needs. Thus, the process of implementation and use

of the proposed model of e-textbook will be dictated by the needs and processes carried out by the implementing institutions.

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