e-Learning– Past and Future
Chief Assistant Professor Yoana Minkova, PhD
Informatics Department
New Bulgarian University
Sofia, Bulgaria Yoana Minkova, Bulgaria

Abstract:
The article presents the evolution of e-learning, since its early beginning of last century till the present days. Different technologies, used in e-learning are described. Future trends are indicated.

Keywords: e-learning, computer-based training, Web-based training, computer-aided learning, computer-based assessment

I. HISTORY OF E-LEARNING
E-learning falls within the broad scientific and applied field, carrying the most common name automation of training. Its history dates back to the early 50s of last century, and has been marked by three main stages:

1. Beginning
This period is known also as electromechanical (1920-1950) and covers the time from the appearance and introduction of computers. The main features of the period include the use of mechanical, electromechanical and electronic devices, enabling the provision of educational content and (self-) control of knowledge with the help of simple technical solutions, technology and media. A key term for the period is software training. There are theoretical bases of technology and a number of devices to implement various types of software training and supervision were created. [1]

2. Interim period
It covers the period 1950-1980 and started with the advent and implementation in practice of computing machines, which provoked the interest of specialists in the field of education. Initially the use of computers in education is quite limited not only due to the shortage of applications for its implementation, but also due to the broad public debate on the pedagogical value. A strong argument in its favour is instantaneous user feedback.
A number of developments for computer-aided learning, automated control of knowledge, automated management systems of the learning process appeared. A specialized software and specialized languages for building such systems (PLATO, Coursewriter, Tutor, Spock (System Programming of training courses) were developed. The obvious benefits of computing machines - memory for storage of content and data for the learning process, high-speed processing and calculations, better visualization capabilities and more were used. Keywords for this period are computer-based training systems, computer-aided learning, computer systems for knowledge control. A significant disadvantage of the developments of this period is their stationary and autonomy due to the use of large universal computers or terminals connected to them. A significant difficulty and disadvantage found in the division of common educational resources and services among multiple users. [1]

3. Present day
It covers the period since 1980 and began with the advent of computer networks and personal computers. Internet (ARPA NET, 1969; WWW, 1989), the use of common and distributed resources, Web-technology (WEB2.0, 2004.), remote access to educational materials provide a significant increase of training effectiveness by improving its accessibility and massiveness. Network technology, high quality and improved performance of hardware, provide for the creation of professional environments and systems for providing educational services and various forms of formal and informal learning.

HTML also contributes to the implementation of educational projects on the Web. As keywords can be given: Internet, Web-based courses, hypertext, virtual learning, virtual university, continuing education, lifelong learning, distance learning, e-learning, mobile learning.
Innovative technologies lead to the development of many options for managing and expanding training and now the ideas for training at any time and place can fully be realized. Now there are over one million training courses in Internet, portals, virtual educational institutions (over 22,000), many innovative technologies lead to the development of many options for managing and expanding training and now the ideas for training at any time and place can fully be realized. Now there are over one million training courses in Internet, portals, virtual educational institutions (over 22,000), many

- The core of the educational platform WebCT is used by about 5 million students who have at their disposal hundreds of thousands of courses developed by 40000 faculty of universities and colleges from 50 countries;
- Blackboard platform is a professional and widely used platform for e-learning in a variety of subjects;
- The software platform "e-Learning Shell" or just "eLSe" works under Windows and Linux using free products such as Apache WEB server with PHP module installed and DBMS MySQL. This platform has the functionality that fully meets the requirements of DG Education and Culture Committee of the European Union;
- Learning Space, IntraLearn, Top Class, eCollege, Click2learn, Authorware, LearnLinc, Virtual-U, Web Course in a Box, UniLearn, WebBoard and many others. [2]

Bulgaria, even in 2012, is located more in the initial phase to the average of application of e-learning. This is confirmed by
research agency Alpha Research Ltd. and IDG Bulgaria for participation in the forms of e-learning of students from Bulgarian universities. The following chart illustrates the percentage of usage of eLearning to 2007: [3]

![Chart showing percentage of usage of eLearning to 2007]

**Fig. 1 Share of computer-based training in Bulgaria, according to data in 2007**

It is clear that the advent of innovative educational methods is still not as wide - 13% of the surveyed students pointed that they had participated in e-learning. This is confirmed by the purposes for which the university websites are used (fig. 2).

![Chart showing distribution of e-access to information in Bulgarian universities]

**Fig. 2 Distribution of e-access to information in Bulgarian universities**

II. TECHNOLOGIES IN E-LEARNING

- **Web based technologies**

There are many different technologies used for training with / without using the Internet. Six basic types of technologies in teaching and way of their use in distance education are distinguished. These are: computer-based training, Web-based training, computer-aided learning, computer-based assessment, teleconference, video recordings and video- teleeducation. The first four will be presented in more details.

- **Computer-based training**

Computer-based training (also could be met as Computer-Based Tutorials or Computer-Based Teaching) gained its popularity in educational organizations. The education is conducted by computer based exercises on different courses, distributed via CD-ROM or floppy disks. With this type of training it is good if the course participants have the opportunity to record their work on hard drives in order to use them in subsequent exercises. Computer based training may be used as a guide for teaching a course, and for lectures as well. It is also used for exploring processes. For example, in mathematics, by changing a numeric parameter, could be seen what changes occur. In chemistry, physics, biology different processes can be simulated. Students, who are studying on a computer, have the ability to absorb the learning material at their own pace. In addition to enhancing the access to training materials, computers are used more for electronic testing, for collaboration (networking), communication (shared resources in a network or using e-mail). With the development of technology today computers and the Internet are used for e-learning and videoconferencing. Today most of the computer-based courses are provided with online material. In recent years this type of course includes many multimedia components. Multimedia training enables students to read text, images, or watch movies and listen to information, while working on relevant exercises on the computer.

- **Web-Based Training**

Web-based learning (Web-Based Training) is a training in which the Internet is used as a virtual environment for the presentation of educational materials and / or for conducting the educational process. The training can be in two forms - to support regular training (as in computer-assisted learning) or to completely replace a course taught in the room. This type of training is often used only for delivering information. This could happen at any time and any place where there is Internet connection, that's why Web-based learning has wide popularity in educational society. Web-based courses are also called cybercourses or virtual courses. In such courses the student plays a central role and he has the opportunity to study at his own pace. Web-based courses widely use means of hypermedia.

Another feature of these courses is the opportunity for communication between students and teachers and between students (e-mail, discussion groups, computer conference or chat), which makes it very suitable for distance learning when such interaction is very important.

- **Computer-aided learning**

Computer-aided learning (Computer-Aided Instruction, Computer-Aided Learning, Computer-Based Learning, Computer-Based Teaching, Computer-Aided Teaching) is close to the computer-based training, but is usually applied as a complement to traditional ways of learning. This method is often used for guidance and assistance to lectures and relevant exercises. In order to achieve greater efficiency in education this type of training is very often conducted in classrooms.

In computer-aided training (CAT) teachers can give students additional explanations during classes or through the Internet. Therefore CAT courses may contain less additional information. The information in the course must be organized in such a way as to be easily accessible, for example by using a hierarchical or hypertext structure of documents.

- **Computer-based assessment**

Computer-based assessment (CBA) is usually regarded as a form of assessment in which the tasks for students and subsequent evaluation of their performance is provided by the computer. Or in other words it is the assessment where, those who monitor and analyze the results of testing and
evaluation are separated in space and time. In CBA the assessment of the answers given by the students must be performed by a computer system. Computers provide tremendous opportunities for collecting and managing large quantities of data from assessment. The main purpose of using computers in the evaluation process is to develop tasks which provide more information about the thought process, tasks that are difficult to achieve with standard tests, such as tests with questions of multiple choice type. CBA has all the features and performs the same roles as the standard evaluation, but along with that there are many advantages.

The main advantages of CBA are:

- Automatic collection of students answers;
- Automatic evaluation of these answers, without the need for intervention of a human interpretation;
- Opportunities for new types of tasks, through media (multimedia) elements. For example, simulations of real or abstract problems;
- The use of databases allows not only storing a lot of information, but also facilitate its founding;
- One of the most notable advantages is the rapid feedback, i.e. the final evaluation is done immediately after the task/test is completed. Each learner is willing to learn your score as quickly as possible;
- Saving teachers time - once created, the questions can be shared and reused in different contexts, also teachers do not lose time for testing and evaluation because the evaluation is done automatically;
- Maximum assimilation of teaching material - it is estimated that 10% of material is assimilated through reading, 20% - by listening, 30% - by watching, 40% - by listening and watching, 80% - by listening, watching and participation (interactivity).

III. FUTURE TRENDS IN E-LEARNING

- Virtual reality

Virtual Reality (VR) is a three-dimensional, computer-generated environment that can be explored and interacted with. This is achieved by wearing a headgear that provides visual and auditory immersion. The level of immersion that VR provides is the reason that makes it promising for the future of eLearning. [4] Recently virtual reality (VR) have been seen as a tool in e-learning course design. It offers developers an opportunity to create more engaging, realistic learning experiences that cannot be replicated by textbooks, videos, and other types of media. Learners become fully engaged, with the learning material, which makes the learning experience more interactive and entertaining. This helps them imbibe information at ease. One of the most effect ways VR technology is being applied to e-learning is to teach high-risk tasks in the form of simulations. Learners earn digital experience by practicing simulated tasks that are considered dangerous in the real world.

- Gamification or game based learning

Incorporating game elements into a learning program is a great way to empower learners to act freely, show competency, and work together. There are many benefits of using gamification within your eLearning courses. Gamification can motivate learners if a competition is an element of learning. It also can be used for personal experience – the learner to choose which part of a course is the most important to him and explore it. It is easy to give the student a feedback which guides him how to manage better next time. According to [5] over 75% of people played online games moderately to fairly often. In fact, 80% of respondents said that they felt they’d be more productive if their university or work environment were more game-like.

- Mobile learning

mLearning or mobile learning, as the name suggests, includes learning through many devices that are wireless and can be connected to the internet. Learning according to one’s own pace and time is one of mLearning benefits. Some others are nominal costs and fun and interactive teaching methods. mLearning is enabled by a range of technologies including smartphones, tablets and wearable devices (e.g. Google Glass and smart watches). These devices have a diverse functionality (multimedia options, social networking communication and geo-location GPS capabilities) and learners can connect to virtual learning environments, personal learning networks, learning conversations, open educational resources and a diversity of apps (e.g. augmented reality apps). mLearning is an opportunity to learn outside of the classroom. Liberated from a desk, students can enrich their learning in new environments and with a powerful relevancy to the subject at hand. [6]

- Cloud-Based E-Learning

Most companies providing e-learning already have switched to cloud solutions. In spite of a common misconception about insecurity of cloud data storage, e-learning providers constantly are improving their data security level. More importantly, cloud systems are easy to use and support. There is no need to install the software on each computer, and no need to hire technical staff to maintain the system’s work. [7] Shifting e-learning systems onto Cloud has the potential to provide guidance in different aspects for e Learning, that will be used in the future as follows: planning and designing e-learning materials, organizing resources for e-learning environment, designing distributed learning systems, corporate universities, virtual universities and cyberschools, designing LMS, LCMS and comprehensive authoring systems, evaluating e-learning courses, and programs. [8]

IV. REFERENCES

[1] William Horton Leading E-learning, Published by ASTD, 2001 by American Society for Training & Development


