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E-learning: Analysis, Advantages and Disadvantages

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Abstract — **The paper is focused on e-learning overview: from plurality of definitions to distinction in between e-learning and distance learning, classification, time frames and levels of e-learning. Furthermore, pedagogical aspect and characteristics of e-learning process are presented and basic concept of quality of e-learning. The paper also summarizes overview of advantages and disadvantages with summary and the anticipated development of e-learning as a form of learning.**

Keywords - e-learning, pedagogical, advantages, disadvantages

I. INTRODUCTION

For several decades, information technologies have been represented in education. Due to fascinating development of the Internet in the current decade (in terms of number of users, connection speed, and development of devices that can be connected to the Internet and the availability of various, even educational materials on it), usage of e-learning is increasing around the globe. The classical methods of education can now be supplemented with various multimedia content and interactive features that make this activity of higher quality and more interesting (especially for younger generations) [1].

E-learning is a process of education or supplementation of the classical form of education, which is carried out with the help of the Internet and various multimedia content and interactive elements. Furthermore, e-learning also includes the enrichment of traditional teaching, and a common example of how e-learning is performed is to visualize the teaching theme with the help of a projector, a computer, and a projection screen or display. Technology has become involved as an important factor in the process of knowledge transfer [1].

While online learning, as the dominant form of distance learning, as its name implies, is necessary to be online, e-learning is a broader term that does not just mean teaching and learning through networks [2]. This is to make a distinction between the two terms mentioned, as they are often identified in public. So, for participating e-education it is not necessary to be connected to the Internet, although e-learning usually involves learning through the Internet with the help of multimedia units and a lot of interaction, which the learner attends during the class.

This learning model has become possible because there is a large amount of different data on the network (also from almost all the world's famous libraries and archives), as well as the possibility of sharing it. In student-content-teacher relations, digital technology became an important factor in the process of knowledge transfer. In multimedia education, each individual medium can maximize its overall performance by making full use of its characteristics. Teaching thus becomes more experiential, rational and effective, giving full effect by combining written text with video, music and sound effects, animations, etc., which is suitable for students who are comfortable with different types of learning [3]. "E-learning is an interactive and two-way process between teachers and students with the help of electronic media with the emphasis on the process of teaching while the media are only the tool that completes the process" [4].

The number of programs and platforms that provide opportunities for children and young people to acquire adequate knowledge through the Internet is increasing every day.

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II. Classification and Time Frame of E-learning

E-learning as a form of education exists as a completely independent form, but also as an integral or complement to classical education. Depending on the intensity and usage of information technology, there are several forms of e-learning [1]:

- Learning with the help of information technologies
- Learning that uses technology to improve knowledge transfer
- Hybrid or mixed learning - a combination of classroom teaching and information technology learning
- Online (distance) learning - learning that is fully organized with the help of information technologies, so that the participants do not meet in person.

E-learning is taught in accordance with the technology of delivery of teaching content, and can be divided into asynchronous and synchronized in the literature.

Asynchronous learning is one in which teacher-student interaction occurs from time to time, hence with a delay of time. The teacher and the student communicate, while their activities are not synchronized in time.

Synchronous learning involves the interaction of teachers and students in real time, and activities are carried out according to a predetermined plan that ensures synchronization.

III. Levels and Implementation of E-learning

There are two basic types of e-learning: mixed-hybrid learning, which involves the combination of classical classroom teaching and information technology teaching and "pure" e-learning, a form of learning in which students learn independently and online. E-learning is a process that cannot be activated at once. It is accepted in four cycles [5]: the first stage of e-learning is improving traditional teaching with new materials and tools, but without changing teaching methods (for example, using Power Point presentations in teaching, using the Internet for research purposes, the use of e-mail in teacher- students communication, etc.). In the second stage of e-learning, new tools for managing (such as software for the distribution of teaching materials and tests that can provide electronic communication between teachers and students, processing and monitoring of learning outcomes, etc.) are introduced in teaching. The third level of e-learning involves creating, sharing and using reusable learning objects that are made upon a declared standard. These learning objects can be different in nature - from purely textual metadata documents to complex learning platforms that provide a large amount of different content and a high level of student interaction with the curriculum. The highest level of implementation of e-learning refers to the new program configurations that arise when teachers and educational institutions completely redesign learning activities and teaching to reap the full benefits of new technologies, without any admixture of traditional teaching.

We have to keep on mind that the introduction of e-learning in an environment is not an instant process. On the contrary, in order to efficiently introduce e-learning in teaching we have to meet some basic requirements. Three basic preconditions for the introduction of e-learning in the classroom are: existence of appropriate standards; strategic equipment of educational institutions for the introduction of information and communication technologies in the educational process; and support to e-learning [6].

"A synonym for modern education today is e-learning, but the introduction of this system of education is not a simple process. For the effective implementation of e-learning in the educational process it is necessary to fulfill three basic conditions: the existence of appropriate standards, strategic equipment of educational institutions for the introduction of ICT in the education process and support e-learning" [7].

IV. Pedagogical Aspects and Characteristics of E-learning

It is well known that the average student notices only ten percent of what he has read, 20 percent of what he has heard, 30 percent of what he has seen, 50 percent of what he has heard and seen at the same time, 70 percent of what he can dramatize and write himself and 90 percent of what he designed and wrote. That is why such concept of learning should be applied in which pedagogical situations would engage the whole personality of the student, all his mental, affective and conative capacities. These situations are most successfully produced by

multimedia learning [3]. Contemporary pedagogy has been rapidly embracing the development of technology that can be used in all e-learning, developing a multitude of theoretical and practical models. Due to its flexibility, e-learning is becoming increasingly popular as it offers the learner an opportunity to work independently, engage and progress according to individual needs, abilities and interests. The multiplicity of ideas and the ability to exchange them quickly improves quality, and there has been an interest in using new learning processes [1].

The changes and opportunities that e-learning brings in pedagogical sense are [2]:

- Flexibility of time and place of attendance. While traditional education means a place where teaching and the transfer of knowledge are carried out, today it is no longer necessary. Therefore, not all participants in the education process need to be in the same place and at the same time. There are several types of teaching that can be distinguished here by time and place: same time and place (classic classrooms with multimedia presentations), same time and different places (videoconferences), different times and same place (electronic forums and tests), different times and different places (emails, online forums, video conferences, etc.).

- Interactivity in communication: student - student; student - teacher; students - teacher. Successful e-learning must enable multiple modes of communication. It is most commonly used in various forms of discussion forums, e-mail, audio communications and various forms of simulations and animations.

- Individual access to students. This element implies a high level of focus on the student (which makes it extremely suitable for adult education), insists on developing opinions and acquiring new skills. Therefore, the pace and dynamics of work of each level of e-learning can be adapted to each student individually, and external disturbances are minimized. Therefore, there is no disruptive factor in the case of classical group and teaching where it generally happens that group members are progressing at a different pace when acquiring knowledge. As a result, psychological, didactic and methodical circumstances are different.

- Possibility to increase the level of motivation for teaching and education. By applying the different elements and strategies of e-learning, especially older students and employees can be motivated to learn or continue.

- Global knowledge reflected through access to learning materials from different educational systems and countries, as well as access to digital databases, libraries, cultural and other centers.

- Cost-effective (the cost of distance education is lower because fewer teachers work with more students, the cost for students is lower because they can study in the place of residence, they do not have to go to classes, except for consultations and exams).

V. Advantages and Disadvantages of E-learning

Based on the literature, we will try to summarize the basic advantages and disadvantages of eLearning.

Among the main benefits of e-learning are [1]:

a) Time and space flexibility

E-learning is tailored to the individual needs of the user (anytime and / or anywhere). Thus, students have the opportunity to learn independently of time and position, making education accessible to those who would not be able to come to the classroom, e.g. due to geographical distance, inability to fit work responsibilities with traditional teaching, health difficulties, etc. Furthermore, e-learning enables continuous learning, i.e. the concept of lifelong learning.

b) Student-teacher interaction

As communication takes place with the help of IT and the Internet (e.g. e-mail, forums), e-learning can be more intense, better measured, and often more meaningful than communication in traditional teaching. In this form of teaching, questions are often asked more freely, without fear of the authority of teachers, which is extremely important for people with poorly developed live communication.

c) Communication and group work

Discussion with other participants (e-mail, forum, chat, teleconferences, etc.). Teamwork on collaborative projects through e-learning can develop social and communication skills.

d) Global access to educational content

E-learning has provided access to materials from all over the world, which is usually not possible in classical teaching.

e) More up-to-date and up-to-date educational materials and easier professional development

Learning content can be tailored to individual students, e.g. content can be added for those with poorer start knowledge, as well as for more advanced students who want to learn more. Because of its concept of accessing more material than conventional teaching, e-learning makes it easier to get further training or retraining.

f) Interactive learning content

E-learning uses a variety of media (text, photography, display, sound, video, animation, etc.), which, according to many studies, makes it easier to acquire knowledge.

g) Temporal openness

Content availability can be 24 hours every day of the week.

h) Unlimited students

An unlimited number of students in the e-classroom are enabled.

i) Easier assessment and monitoring of students

With e-learning, the teacher has the opportunity to test each student's knowledge in many ways and at different time intervals, and to more easily monitor each student's acquisition of knowledge.

j) High level of individuality and personalization

Students learn independently, at their own pace, in a place and time that they choose, at different levels of interaction.

E-learning has its disadvantages as well:

a) Certain knowledge and skills are required for e-learning

Without some technical literacy, higher levels of e-learning are sometimes difficult to track.

b) Greater responsibility and motivation of users

E-learning brings greater responsibility to students. They often have to motivate themselves, which can lead to questionable results and poor progress in the learning process. Also, according to some studies, e-learning has a large number of students dropping out of the program.

c) Lack of live contact between the student and the teacher

Due to lack of live contact with the teacher, students may experience a sense of loneliness and distance, which can have a disincentive to the motivation to learn. Loss of human contact and body language (non-verbal communication) can be modeled by a lack of understanding. Also, this counts for the absence of oral exams and proficiency tests.

d) Conditionality of technology available

For technically demanding programs, all students need to have the appropriate technology at their disposal, such as a computer with an adequate version of a web browser, programs for displaying multimedia records, high-speed Internet connection, etc. The technology used for a course can be very demanding (for example videoconferencing), and thus preventing the attendance of those students to whom the technology is (to a sufficient extent) not available.

e) The equipment is not 100% reliable

Even the highest quality e-learning equipment is not 100% reliable. If technical problems lead to interruption in e-learning, there will certainly be a decrease in motivation and concentration of users, and consequently a decrease in the quality of e-learning.

f) There are areas that cannot be studied exclusively electronically

When it comes to e-learning in form of distance learning, there are limitations to certain programs that include lab work, demonstration exercises, etc. This is especially pronounced in the field of medical and technical sciences, as well as in traditional arts disciplines.

VI. CONCLUSION

The modern age imposes the imperative of IT and Internet in almost every sphere of life, including education. This was reflected in the rapid development of different forms and models of e-learning. Due to its flexibility, this learning model is becoming increasingly popular as it offers the learner ample opportunity to work independently, engage and progress according to individual needs, abilities and interests. The multiplicity of ideas and the ability to exchange them quickly improves quality, and there has been an interest in using new learning processes.

New technology enables teachers and students to raise their learning to a higher level of thought, to engage in analysis, synthesis, inference. Instead of repetition, drill (exercise) and playback, teaching can focus on discovering and solving problems. The teacher can devote more time to interaction in the classroom, relationships in the teaching process, individual approach to students [8].

It is certain that the presented forms and models will continue to evolve, just as researchers and practitioners in this field will seek to innovate. In this endeavor, technology will play important role in creativity of designing teaching process that makes the most of all the benefits of information technology, while minimizing their disadvantages [1].

Leading e-learning organizations and institutions around the World are working to focus on developing and refining e-learning standards. The basic starting point is the need for knowledge management. Therefore, the development of technology and standards will play an important role in the further development of e-learning. Basic direction is creation of platforms (or upgrading of existing ones) that will allow easier access and implementation of teaching content, but also facilitate the exchange of teaching materials and communication between different e-learning platforms. E-learning as such is the present and the inevitable future, which will eventually take on an increasing number of students of all ages.

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