E-LEARNING EVOLUTION TRENDS AND INNOVATIONS IN THE HIGHER EDUCATION

Ivan Dimitrov[1]
ivan_dimitrov_unwe@unwe.bg

Abstract

E-Learning Evolution: Trends and Innovations in the Higher Education is a topic that explores the impact of digitalization and new teaching methods used by most of the lecturers. This paper will explore the current changes in the higher education, what are the new teaching methods in universities across Europe, what are the expectations for future development in this area, and what is the impact of new technological innovations and digitalization on the education. Furthermore, a prognosis and several conclusions will be prepared based on the findings from the research. This paper presents a literature review of various previous publications from different reputable sources through analysis and synthesis of the information.

Keywords: e-learning, educational trends and innovations
JEL: D83, I23, I25, A23, A29

Introduction

E-learning, or electronic learning, is a new step in the evolution of teaching and learning processes in the 21st Century and is supported by the worldwide implementation of the Internet and the progress in digitalization. E-learning is also increasingly entering people's lives through technological innovations and the desire of learners for easier access to educational opportunities.

In this article we will summarize the main trends of this phenomenon from few previous researches, but we will not go into detail about each of them as this will be the major limitation of the topic. The study itself will be a prerequisite for further in-depth researches in this area. The main aim of the author is to give the readers an insight into the development of e-learning and its current trends. Besides the scope of this study, another limiting factor will be the period. In order to provide the most up-to-date information possible, the focus will be on the most recent studies in this area from the previous 10 years or less.

[1] Phd, Assistant Professor at the Department of International Economic Relations and Business, UNWE, Sofia, Bulgaria.

Methods of research

The methods of research include analysis and synthesis of various publications on the topic. Furthermore, the main data comes from original papers of international researchers, who have published their articles in Scopus, Web of science and other scientific journals or articles. The used databases include statistics from reputable sources like Statista and Eurostat.

E-Learning History and Evolution

The concept of E-learning has a historical development for more than 30 years, which is also supported by the Internet revolution. According to findings from previous researchers (Bezovski, 2016) it has even older history of more than a century, which is connected to „mail-learning method through correspondence courses" from 1920s. According to Bezovski the „CD-based training" was also a major breakthrough in the e-learning techniques.

Other authors divide the e-learning evolution into different stages (Smyrnova-Trybulska, 2019):

- First distance learning stage (around 1970), when course contents were totally delivered by regular mail;
- Second stage (1970 -1980): Open Universities – they offer access to study materials to students, who are learning remotely or have limited access to the campus;
- Third stage (1980 – 1990): Video cassettes and TV;
- Fourth stage (1990 – 2000): Computers, multimedia, interactivity, e-Learning;
- Fifth stage: Online Learning Environment (ongoing) – it is the latest learning method that takes full advantage of new technologies and learning trends to reach the largest number of students.

This division into periods helps to better define the time horizon of the concept under study in relation to the main trends at the time for the implementation of training approaches. By tracing the evolution, the influence of changes in the attitudes of the population and the openness of higher education institutions to everyone, but also to new technological devices such as videotapes, computers, multimedia, can be taken into account.

Benefits and disadvantages of E-Learning

Nowadays, the modern e-learning offers numerous benefits for all interested parties. Among them we can highlight the following (Ahmed, 2022):

- Affordability – it does not demand significant financial efforts for the educational institution or the students;
- Accessibility – the need for Internet and smart devices is the only requirement in order to access the online material database and start the e-learning process as a student. Furthermore, teachers could use online evaluation tools;

- Flexibility – For many of the course participants, it is convenient that they can combine e-learning with their work and other commitments because they can browse the online platform at their convenience;
- Frequently Updated Content – the materials are often updated up to the current trends and the new changes in the selected subject;
- Self-Paced Learning – the most common is that each learner can decide at what pace to learn in the platform and does not need to take into account the progress of others;
- Strong Analytics – The lecturers and the students can use the analytical data on the respective platform to check the various metrics such as percentage of correct answers in the questions, pass rate through the lectures, study time, and others. It is used to improve the learning process and experience for the students;
- Format Variety – like live lectures, videos, quizzes, and interactive simulations or others. They depend on the lecturer, platform and the students' preferences;
- Interactivity – for example interactive elements like discussion forums, polls, and gamification, enhancing engagement and collaboration among learners. The young learners usually are more engaged to interactive content than the previous generations.

But alongside its benefits, the e-learning process has also some disadvantages (Tamm, 2023):

- Dependence of the technology and internet access – without internet and modern smart devices like computer, phone or tablet it is not possible to access the online platforms, which support the E-learning. Therefore, some countries are still behind the in the usage of digital tools due to low living standards and technological adoption;
- Limited interaction with the teacher – The teacher or the instructor is only visible on the screen and usually there is limited personal contact with each student, but rather group approach except in certain cases like individual lessons or specialized classes. The limited feedback from students is another problem, which is very common;
- Social isolation – since the person is studying alone and remotely, the social isolation is felt with the lack of communication with other students outside of the online session and the contact between them is partly restricted. This is not an issue with the traditional classroom learning method;
- Need for strong self-motivation and time management skills – this is valid for everyone, but especially for working people, who have to arrange their time in a way to combine work and online lessons;
- Lack of communicational skill development in online students – this disadvantage is with strong impact to the younger students, which are still developing their socializing skills;
- Limited ways to prevent cheating – the common practice is that the students have many ways to cheat during the online exams. For example, they can use another smart device to look for answers or to use someone else to pass the exam in their place. There are some ways to prevent it like automated ID verification and the

assistance from AI to detect dishonest test-takers, but also live video feed and screen monitoring software;
- Focus on theory rather than practice – it could lead to reality, where some students are underprepared for real-life working environment due to the focus on theoretical preparation.

Different categories of E-Learning

After we have pointed out the benefits and the disadvantages of the e-learning, it is time to move on to the different categories of e-learning (Pachauri and Upadhyay, 2024):

- Completely Online: It is done exclusively in virtual environment without face-to-face physical meetings with teachers or classmates;
- Blended learning: This approach combines online education with in-person instructions. The students may attend certain classes virtually while participating in others physically;
- Synchronous learning: Synchronous learning occurs when you participate in an online class led by a teacher in real-time. This means you may need to log in at a designated time to join the session;
- Asynchronous learning: This type of learning allows you to progress at your own speed. You may have online resources or materials stored on a device, enabling you to study them whenever it is suitable for you;
- Instructor-led group learning: This refers to attending an online class with other students and a teacher. The students may come from various locations around the globe, but they all receive instruction from the same lecturer;
- Self-study: Self-study involves learning independently by exploring websites, reading articles or watching tutorials. Although there are no teacher or classmates, there is still a significant opportunity for learning;
- Self-study with a subject matter expert: Similar to the previous one with the exception that there is a lecturer involved. You might frequently visit their website to gain insights and knowledge from their expertise or ask them directly;
- Web-based learning: This type of learning involves acquiring knowledge by searching for information online using various search engines or engaging with social media groups. It allows individuals to explore a wide range of topics and resources independently;
- Computer-based learning: Accessing study materials from the Internet or from storage devices such as CDs, DVDs, or USB drives allows you to review the content on a personal computer or laptop.
- Video/audio tape learning: This occurs when you acquire knowledge by observing or listening to multimedia content. You can discover these resources on platforms like YouTube or other video and audio sharing sites.

According to the category or preferred method of e-learning, each student can choose the most suitable for him. This makes it easier for the learner to access resources

and gain new knowledge. In addition, there are various cases where the use of a particular category is recommended over others. For example, if the student is in a country with low Internet speed or poor coverage, then it is more appropriate to use audio or video materials on CDs or flash drives.

E-Learning Evolution Trends

The E-learning variations have developed in different directions as teaching methods that have their own distinctive characteristics and serve specific purposes. Here are the most popular ones (Smyrnova-Trybulska, 2019):

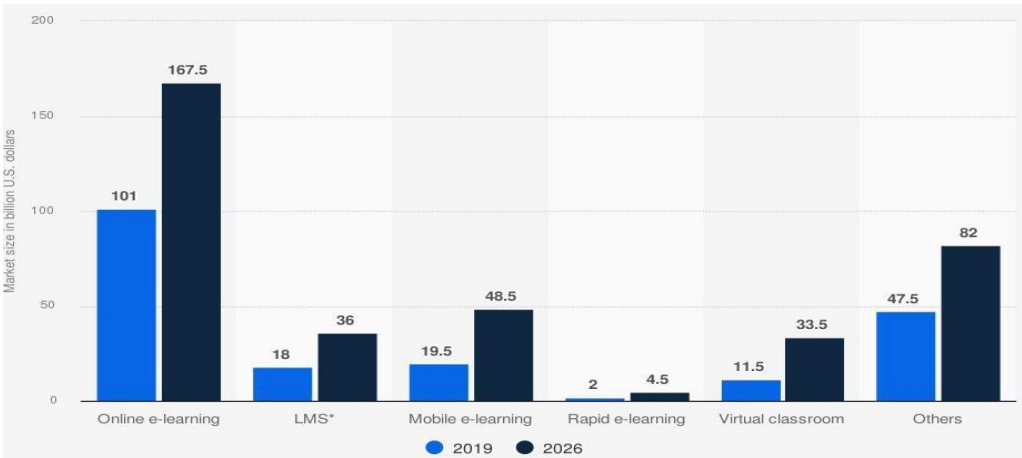
- Adaptive learning – it is done via the so called LMS (Learning management system), which is a software-based platform that supports the efficiency of the course and offers access to the study materials to the students. The adaptive learning uses such educational tools in order measure and evaluate the performance of the student;
- Blended learning – is an educational approach that combines online digital media with traditional classroom methods currently used in many universities. As stated above it blends the online and in presence teaching methods;
- Microlearning – refers to delivering bite sized learning content in short and focused bursts of information. The idea is that the learner can go through small portions of data in order to learn it better and for short amount of time. For example, microlearning is used for games, quizzes or infographics and others;
- Video and podcasts-based learning – it is very popular nowadays and as a major example can be pointed the YouTube videos and different video tutorials. With video presentation are achieved better audience focus and engagement by maintaining the relevant context of the training material and specific information for the viewers;
- Problem–based learning – such training develops the critical thinking of students, their problem-solving skills and helps them to coordinate better in a team. It is most often based on the use of real-life case studies;
- Project–based learning – similar to the problem-based learning, but the difference is the assignment to prepare a project with the goal to present different solutions to the problem at hand with the help of the lecturer;
- App-based learning, collaborative learning and digital storytelling – includes various software with digital content, where multimedia tools including graphics, animation, video and audio content are being implemented with the purpose of presenting information in more creative ways;
- Flipped classroom – the idea is the students to be more involved in the classes and one of the creators of the idea is Salman Khan (from Khan Academy). In the flipped classroom approach the lecturer is no longer the dominant figure and the students take the proactive approach with more discussions and debates;

- Gamification – involves applying game elements and principles to non-game contexts to drive engagement, promote learning and desired behaviors with problem- solving skills. The sole action of creating goals and achieving them stimulates the motivation of the learners. For example, Duolingo is one famous application that uses gamification in order to require new knowledge;
- Inquiry–based learning – similar to Microlearning, Blended learning and Project–based learning, where students are encouraged to solve problems using their research skills and with initial guidance from the teacher;
- Personalized learning – tailors the educational experience to each individual learner's needs, preferences, and goals. The lessons are tailor-made for each student according to the desired results. For example, personalized learning can be provided by personal mentors, trainers or influencers;
- Massive Open Online Courses (MOOCs) – are online courses designed for large scale participation and open access via the Internet. Famous examples include Coursera and Khan Academy.

Having summarized the main varieties of e-learning in the present, we should clarify that each of these methods is used according to the purpose of learning, the preferences of the instructor and the learners, as well as their available technical resources. Furthermore, it is important to remember that they can be used in combination between each other as long as separated.

Statistics

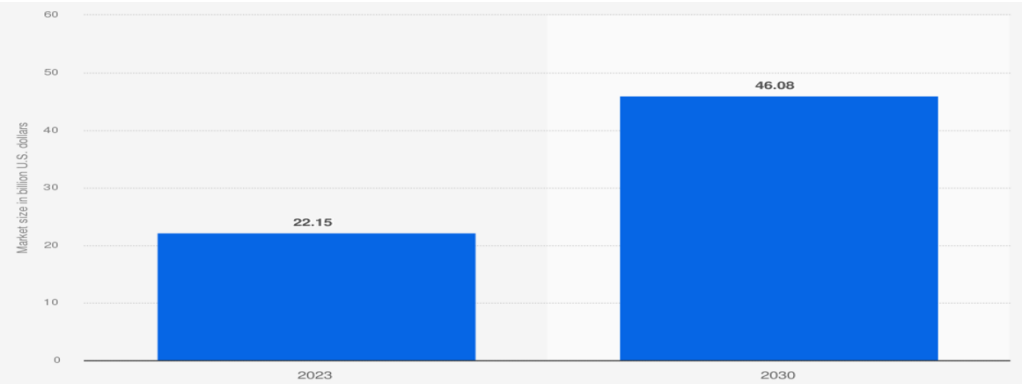
Currently the statistical information points out towards the rapid rise in the usage of e- learning technologies and the growth of its market. Now we will examine the market size based on data from a reputable source (Statista, 2019) in the following figure:



Source: Statista

Figure 1. Size of the global e-learning market in 2019 to 2026, by segment (in billion USD)

The figure above shows the prediction that all examined e-learning segments are expected to almost double in market value and consequently in size by year 2026. Since the prediction from is from 2020, it should be noted that at the moment the expectations are for even bigger growth to this market. For example, the number of the learners from Coursera has increased from 21 million in 2016 to 148 million in the first quarter of this year (eLearning Statistics, 2024). This is more than 700% growth for a period of 8 years and only supports the prediction that the market size and the number of users of such platforms is bound to increase even more in the future. This is suggested from the next figure with newest data from the same source (Statista, 2024) about global corporate e-learning industry:

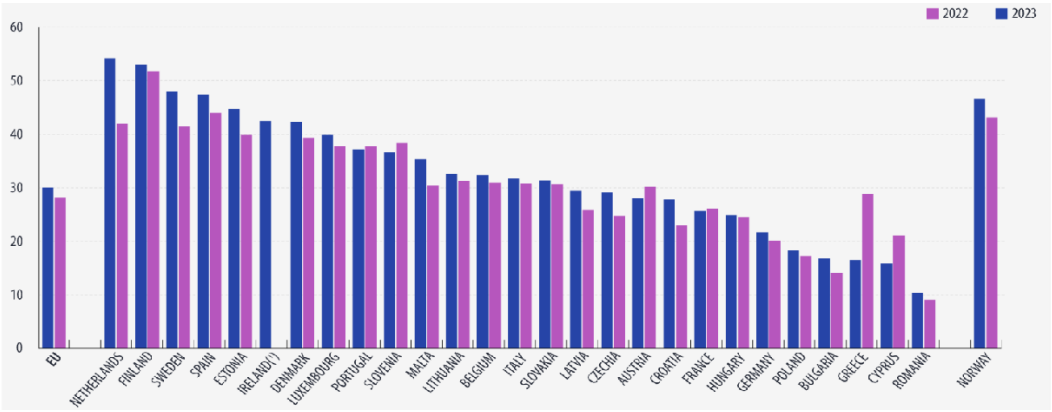


Source: Statista

Figure 2. Market size of the global corporate e-learning industry in 2023 with a forecast for 2030(in billion U.S. dollars)

This forecast supports the idea of the rise of global corporate e-learning industry from 22,15 billion dollars in 2023 to 48.08 billion USD in 2030. Therefore, we can assume that the potential for development and growth of the companies on this market is existing and they are developing at an increasing pace, supported by the processes of digitalization and e-learning. Online learning in the European Union is also on the rise and many countries have already implemented it within primary, secondary and higher education.

Regarding the situation in the EU, many people are already using e-learning and there is a clear trend towards its increasing application and integration into all country-members.



Source: Eurostat

Figure 3. People doing an online course or using online learning material, 2022 and 2023 (% of individuals, who used the Internet in the last 3 months)

According to the data in the figure above from the reputable source (Eurostat, 2024), between 2022 and 2023 there is 2% increase in the number (on average for the whole EU) of users between the age of 16 to 74, which have indicated that they had participated in an online course or utilized online learning resources in the last 3 months. This means that almost every third person in this age group have benefited from e-learning. The most successful countries in this regard are the Netherlands, Norway, Finland, Sweden, Spain and Estonia, where one in two have used online learning in the previous 3 months. By contrast, countries such as Romania, Cyprus, Bulgaria, Greece (with biggest decrease in percentage points within a year) and Poland should take measures to improve the computer literacy of their citizens, but also to implement stimulus in order to use online platforms, databases and information.

E-Learning Trends and Innovations in the Higher Education

Currently, the e-learning trends and innovations in the higher education are similar to the ones in the other education levels and can be summarized from the results of a recent research (Pribilov and Beno, 2024) as follows:

- Augmented Reality (AR) and Virtual Reality – the difference is that AR integrates computer-generated images and videos for mixed reality between the real and the virtual world, while VR offers completely virtual environment;
- Microlearning and Nano-learning – we have already mentioned them, but the difference is the nano-learning, where the fragments of information are even smaller;
- Artificial Intelligence (AI) and data analysis – the rise in the usage and capabilities of AI are promising about the data analysis of huge databases and it is amazing for how short period of time AI has become part of the daily life;

- Blockchain in E-learning – The development of the blockchain technology has included many purposes, but one of them is about integration in the e-learning platforms in order to enhance security and authenticity, to personalize learning experience, improve payment systems, and to improve assessment process;
- Gamification – with the help of AI gamification is nowadays not only an option, but a leading trend in the e-learning, which is also preferable for a lot of students;
- Others: such as Quantum computing and Metaverse are still under development, but the expectations are that they will bring major changes to the E-learning industry.

Conclusion

The evolution of e-learning in higher education is characterized by significant technological advancements and changing environment. The future of online education looks promising with innovations, which enhance learning experiences and accessibility for a diverse range of students. But e-learning faces challenges such as ensuring quality and engagement in online courses, addressing the digital divide and maintaining effective communication in virtual environments. However, e-learning offers also many benefits that guarantee its continuous usage globally, including in the higher education environment.

References

Ahmed, Rizwana. (2022). What Is eLearning And Top 10 Benefits Of eLearning. eLearning Industry Inc. Available at: https://elearningindustry.com/what-is-elearning-and-top-10- benefits-of-elearning (Accessed: 25.09.2024);

Bezovski, Zlatko & Poorani, Subitcha. (2016). The Evolution of E-Learning and New Trends. Information and Knowledge Management. Vol.6, No.3, 2016. SSN 2224-5758 (Paper) ISSN 2224-896X (Online). Available at: https://www.researchgate.net/publication/354381498_The_Evolution_of_E-Learning_and_New_Trends (Accessed: 25.09.2024); eLearning Statistics. (2024). Available at: https://elearningstats.education/ (Accessed: 25.09.2024).

Eurostat. (24 January 2024). Increase in online education in the EU in 2023. Available at: https://ec.europa.eu/eurostat/web/products-eurostat-news/w/ddn-20240124-2 (Accessed: 25.09.2024).

Pachauri, Shivam & Upadhyay, Ashok. (2024). E-Learning Platforms: A Way of Enhancing Teaching and Learning. Available at:

https://www.researchgate.net/publication/383431323_E-Learning_Platforms_A_Way_of_Enhancing_Teaching_and_Learning(Accessed: 25.09.2024).

Pribilová, K. & Beňo, M. (March 2024). New Trends in E-learning and New Approaches to the Development of E-learning Educational Materials. R&E-SOURCE. p. 193 – 206.

Smyrnova-Trybulska, Eugenia. (2019). E-learning – evolution, trends, methods, example and experience. International Conference e-Learning 2019. ISBN: 978-989-8533-88-3. Available at: https://files.eric.ed.gov/fulltext/ED621618.pdf (Accessed: 25.09.2024);

Statista. (June 11, 2020). Size of the global e-learning market in 2019 and 2026, by segment (in billion U.S. dollars). Available at: https://www.statista.com/statistics/1130331/e-learning- market-size-segment-worldwide/ (Accessed: 25.09.2024);

Statista. (February 15, 2024). Market size of the global corporate e-learning industry in 2023 with a forecast for 2030 (in billion U.S. dollars). Available at: https://www.statista.com/statistics/1232427/global-corporate-e-learning-market-size/ (Accessed: 25.09.2024).

Tamm, S. (2023). 10 Biggest Disadvantages of E-Learning. Available at: https://e- student.org/disadvantages-of-e-learning/ (Accessed: 25.09.2024).