New Trends in e-Learning

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Abstract

Guidance work is needed to learn about the current state of e-learning and to guide future research. In recent studies, e-learning environments appear to be under different headings in recent years. These new topics are mainly aimed at providing an up-to-date explanation on e-learning in this section. New trends in e-learning will be covered under artificial intelligence (AI), micro credentials, big data, virtual and empowered reality, blended learning, cloud e-learning, gamification, mobile learning, Internet of things, and online video. With this study, it is aimed to shed light on the concept of e-learning. In addition, e-learning environments focus on new possibilities for learners. Everyday, e-learning environments bring out new antagonistic concepts. As these new concepts rapidly entered our lives, they began to become indispensable materials in the field of education. New e-learning environments are being used as platforms that are related to each other. They essentially support the concept of e-learning.

Keywords: e-learning, learning technology, new trends in e-learning

1. Introduction

As in many subjects, new concepts of technology entered our life in education. The increase in the number of students, technological developments, new learning theories and personal needs have led to the introduction of these concepts into our lives. Moreover, these concepts have undoubtedly brought along interdisciplinary studies. In recent years, rapid and low-cost Internet technology and technical developments in information technologies (IT) have also been supporting this process. The development of this process certainly ensured the formation of new ways of learning about e-learning.

E-Learning is a computer-based educational tool or system that enables you to learn anywhere and anytime [1]. e-Learning strategies are spreading to include different education sectors. In this regard, learners indicate that e-learning has made education effective. It is also stated that the most basic benefit of e-learning is flexibility [2]. e-Learning can be considered as a motivation factor in terms of self-efficacy. Students can organize their motivations on e-learning themselves [3]. e-Learning also serves institutions and organizations that want to provide consistent education in more than one place [4].

How can we tell the difference between traditional learning and e-learning? Traditional education is a way for the teacher to present the learning material to the students in the class. The main difference between e-learning and class-based learning is the way in which education is transmitted. In fact, this is a very basic difference. In traditional learning, the teacher can fully control the learning environment by adapting it and, if necessary, changing it. In traditional learning, the teacher's ability, personality, quality, adaptation to the learning situation, and the creation of course material affect the learning-teaching performance [5, 6].

1.1. What are the new e-learning trends?

New focus of e-learning environments is to identify the content area and individualization. In this sense, learners will be included in different e-learning environments. A personal application can be made to be a candidate. In addition, content is rapidly increasing in our time. For this reason, new e-learning materials for learners need to be developed. The e-learning environments that have recently taken place in our lives are artificial intelligence (AI), micro credentials, big data, blended learning, virtual and empowered reality, cloud e-learning, gamification, mobile learning (m-learning), Internet of objects, and online video titles. These new e-learning trends offer significant benefits, such as creating the best education and development plan, creating it in a flexible environment, and creating and maintaining a personal learning environment and continuity.

2. Overview of new e-learning trends

Let's take these new e-learning trends in turn. Let's also look at the benefits of these e-learning environments in terms of learners.

2.1. Artificial intelligence

It is necessary to ignore the individual differences of learners without learning. It is imperative to configure the learning environment and personalize teaching for each user. Artificial intelligence algorithms are used to design e-learning environments that will be created in this way.

New technologies are now seen as complementary support, not as core techniques of educational practice. The use of artificial intelligence (AI) techniques is beneficial to learners in this sense [7]. Artificial intelligence (AI) operating systems, programming languages, and modern software are realized through computer science. Artificial intelligence (AI) is linked

to "mainstream" computer science studies, time-sharing, interactive interpreters, linked list data types, automatic storage management, and so on. Some of the key concepts of artificial intelligence are object-oriented programming and graphical user interfaces and integrated program development environments. Artificial intelligence (AI) is in the pattern with evolutional algorithms, fuzzy logic, and neural networks concepts [8, 9].

Education and artificial intelligence (AI) are two sides of the same medal: education helps learners learn and expand the accumulated knowledge of a society, and artificial intelligence (AI) provides techniques for understanding the mechanisms underlying thought and intelligent behavior. Because of this, today's artificial intelligence-assisted e-learning scenarios are widely used by educational institutions to provide better teaching and learning experiences throughout their training activities. Artificial intelligence (AI) leads to the development of a wide range of artificial intelligence tools as theory and practice. Sometimes, these tools, working under the guidance of a human being and sometimes without an external guide, can solve or help solve a growing number of problems. Artificial intelligence (AI) has produced many important results for students, teachers, the general education system, and societies over the past 50 years (**Figure 1**) [10–12].

2.2. Micro credentials

In education, teachers need to create experiences for students and to experience competence-based learning. Micro credentials can help teachers build personalized, competency-based learning paths and be recognized for a wide range of valuable and important learning experiences. More demand for micro credentials learning plays a central role in how the learner will be presented and evaluated. Micro credential is a focused, short delivery based on competency.
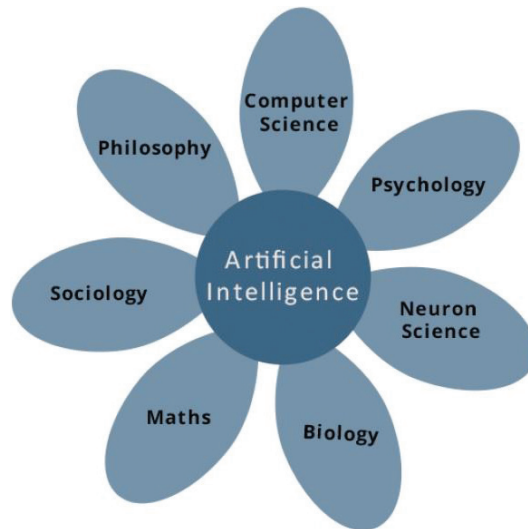

Figure 1. What contributes to artificial intelligence? [13].

Students will receive "deep" knowledge of a specific topic and will show the application of this knowledge [14, 15].

The micro credential is not a single-size fit, it is personalized instead. The micro credential honors the fact that all training professionals and students need something different. And with digital tools, this learning can take place anytime and anywhere [16]. Micro credential offers a strategy for teachers to expand their learning and to confirm and accept recognition as they progress through vocational learning. One of the reasons why micro credential is attractive is that it divides complex teaching skills into basic pieces. Trainees can develop and demonstrate competence at the beginning of each instruction and then link these skills to master competence in complex skills. Teachers can choose which skills or which parts of a skill they will most benefit from professional practice and demonstrate competence by offering what they can do [17].

2.3. Big data

Recent developments in database technologies have made it possible to accumulate and maintain large and complex amounts of data from many forms and from multiple sources. In addition, this complex data is meaningful, and there are analytical tools that can transform the mold. These tools are called big data. It is very important to put teachers into "big data" discussions, because they are the ones that will provide the progress in research and analysis. The projects that teach teachers about which pedagogical techniques are most effective, or how they have changed the way students learn, make it possible for instructors to do a better job. Adapting education to individual students is one of the greatest benefits of technology, and great value helps teachers personalize their learning. In this sense big data holds an important place in education (**Figure 2**) [18, 19].
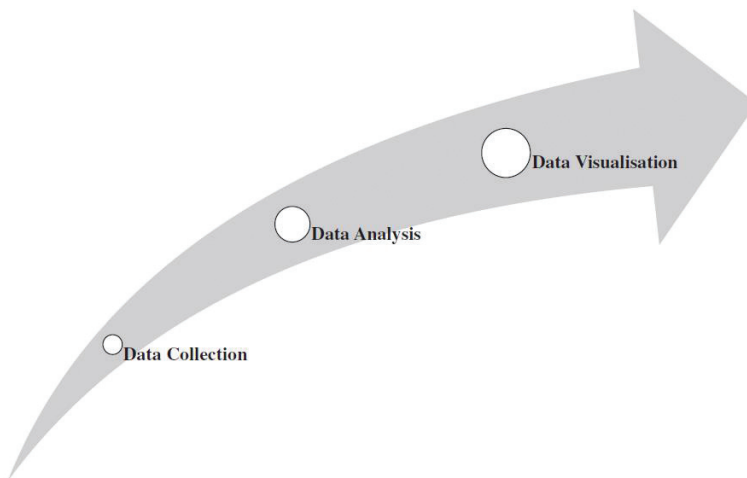

Figure 2. Three essential stages of big data [19].

Student data collected by online learning systems are examined to develop predictive models by applying educational data mining methods that classify or relate data. These models play a key role in shaping adaptations or interventions based on model predictions, to promote adaptive learning systems that can be used to inform learners outside academic services to support what they can learn or to modify student experiences. Two areas specific to big data use in education can be mentioned. One of them is educational data mining and the other is learning analysis [20, 21]. Big data enables a wide variety of data sources to be added, allowing analysis of these various data types. Analytical and predictable options are expanding. This allows for better progress in education [22, 23].

2.4. Virtual and empowered reality

With the use of technologies such as virtual and empowered reality, students can be more visually aware of their classmates and chat with them in real time. They can get immediate feedback from their teachers and get the feeling of being in the same spot with their peers despite their remote physical location. These shared virtual environments also facilitate simultaneous viewing of classroom learning materials and allow group discussions of learning content to be shared at the same time. The use of the virtual reality environment in education and training, which brings many innovative advantages to people of all ages, is impressive [24, 25].

The greatest advantage of using virtual reality to teach purposes in the field of education is that it is highly motivating. In terms of their use in the field of education, for example, when modeled in a molecule virtual and empowered reality, students can examine it in detail and become familiar with molecules, wander, and parts. Virtual and empowered reality allows an object to be examined from a certain distance and shows the whole rather than a piece. The virtual and empowered reality model of a neighborhood offers a different perspective to the connections between residents, buildings, streets, and open spaces [26].

It is also possible to interact based on cooperation with virtual and empowered reality. Therefore, virtual environments also increase the interaction and cooperation between students. These advantages increase student participation by using engaging experiences, reducing attention distractions, and creating positive attitudes when students receive better feedback to easily reach their learning goals [27].

2.5. Blended learning

Blended learning is a case in which a lesson takes place partially online and partly in other ways. In other words, students learn what they learn online in face-to-face environments. In addition, students have control over their own speed. Some researchers believe that this link between a method in a field or in the subject should be included in the definition and the basis for blended learning [28].

Blended learners have a lot to contribute to the field of education. Blended learning enables an enhanced learning experience by enabling various learning environments. It encourages reinforcement. It increases the accessibility of learning materials. It helps create a sense of community and cooperation through forums to share collaborative and communication platforms

and learning experiences. Blended learning models center the student learning process and benefit from the power of technology to create learning environments that are more compelling, effective, and successful [29, 30].

Blended learning is a concept framing the teaching learning process that includes teaching supported by face-to-face and information technologies. Blended learning includes direct teaching, indirect teaching, collaborative teaching, and individualized computer-aided learning concepts [31].

Benefits of blended learning are as follows (**Figure 3**) [32]:

- Expands the areas and opportunities available for learning
- Supports course management activities
- Supports the provision of information and resources to students
- Interacts and motivates students through interaction and collaboration

2.6. Cloud e-learning

The day-to-day growth of data hosting and data processing services on the Internet has enabled the creation of a new concept. Cloud computing for operating companies in various areas such as planning and correction helps to meet the increasing demand. Cloud computing is a promising infrastructure that provides computing and storage resources as a service. Cloud computing can provide services at anytime/anywhere that are accessible from any device from where the users' services or applications are located. All of this and more will be the responsibility of cloud computing [34, 35].

A learning cloud is a cloud computing technology in the field of e-learning, a future e-learning infrastructure, including all hardware and software computing resources to deal with e-learning. After virtual computing resources, they can be services for renting computing resources of educational institutions, students, and businesses (**Figure 4**) [34].
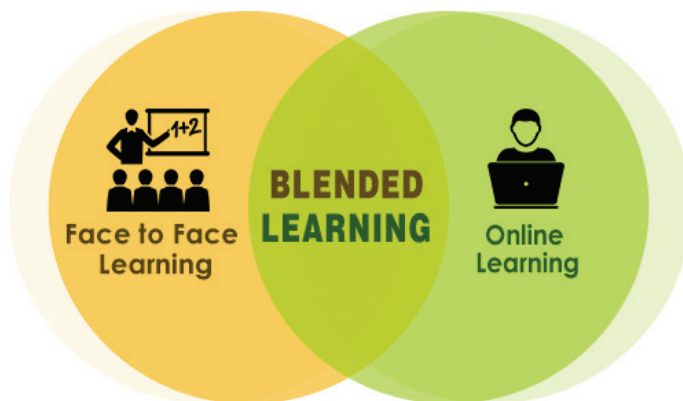

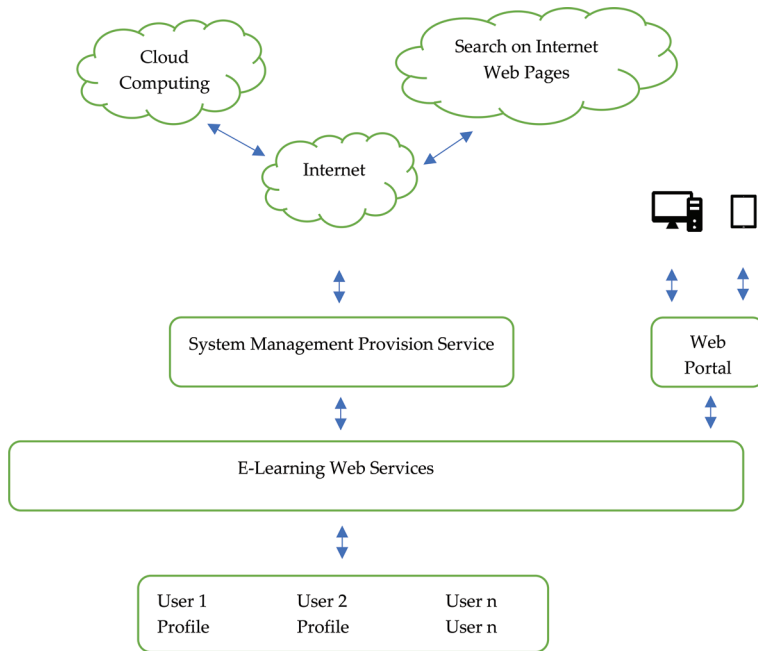
Figure 3. Blended learning [33].

Figure 4. e-Learning services using cache management and cloud computing [36].

2.7. Gamification

Gamification is developing as an academic concept. To achieve this, we need to determine whether the existing gamification structures of the period are significantly different from the research areas and how to relate this to existing sites. Gamification offers new research opportunities. Gamification is the use of game design elements in out-of-game contexts [37]. Gamification is used to motivate gamers to participate in a specific context. In other words, it is the application of fun layers. Most of the existing gamification applications seem to be focused on offering points and rewards to motivate users. Gamification can be a new term. However, game-thinking and game mechanics ideas are not entirely new. These concepts were already used in problem-solving [38, 39].

Gamification is involved in e-learning. In this sense, gamification is the use of a pedagogical system developed in game design but applied in a nonplay context. Game, scoring, level, rosette, or game mechanics are also included in gamification. These are applied in the manner in which a course or module is taught. Game-based learning or play is sometimes used interchangeably. However, they both actually indicate two different pedagogical methods. Game-based learning asks students to play in games designed to enhance their learning rather than integrating the principles of game design into standard classroom instruction. Besides focusing on playing games, they can also be of interest to anyone who wants to introduce game-based learning to their teaching. The addition of game features to learning environments may contribute to the less motivated students' own learning processes and their interactions with other learners (**Figure 5**) [40, 41].
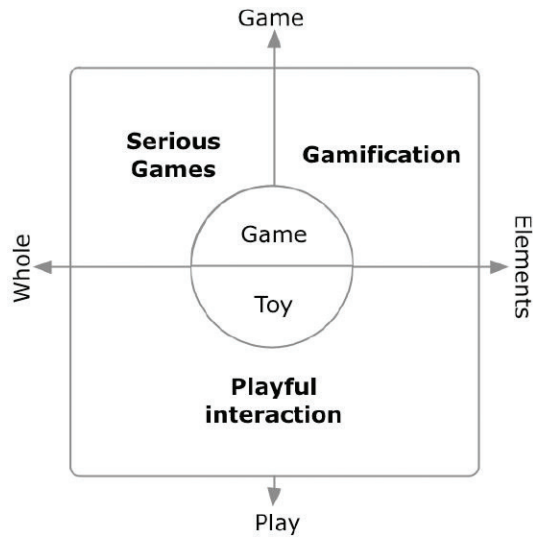
Figure 5. The relevance of serious games, gamification, and playful interaction [37].

2.8. Mobile learning (m-learning)

Today, many technological devices are manufactured in portable form and used by people. These devices shape the daily lives of users differently. Until recently, mobile devices were limited to social communication, and there were few people using it pedagogically. At present, the teaching technology delivered through mobile technology is mostly social and economic (**Figure 6**) [42].

Students can control where and when they want to learn. In addition, all people have the right to access learning materials and information to raise their quality of life, regardless of where they live, their status, and their culture. Mobile learning through the use of mobile technology allows learners to access learning materials and information where they want it. Students do not have to wait a certain amount of time or go to one place to learn. With mobile learning, students are empowered to learn from where they want. They can use wireless mobile technology for learning where they can access learning materials. In this sense, smartphones, tablets, laptop computers, and other mobile devices are great opportunities for learning mobile to offer new and exciting educational experiences. Mobile learning focuses mainly on the development of mobile applications and software platforms used to create digital content in the form of digital textbooks for e-learners and access to educational resources through mobile devices [43–45].

2.9. Internet of things

The Internet of things (IoT) refers to a kind of network that connects everything with the Internet based on prescribed protocols, through information-sensing equipment that conduct
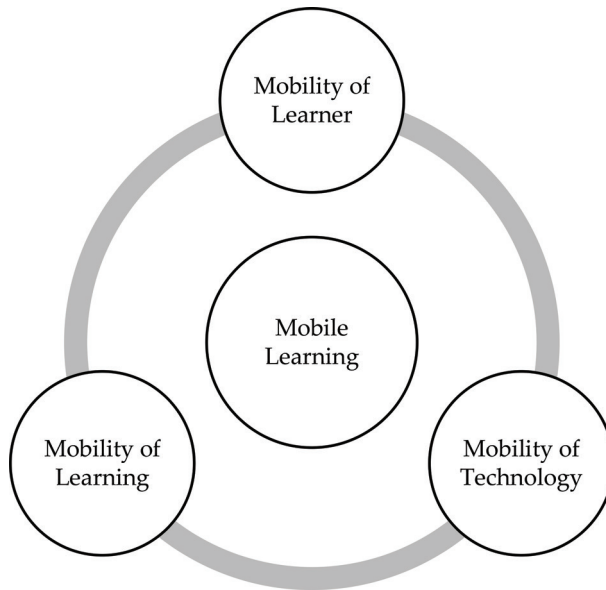
Figure 6. The three concepts of mobile learning [42].

information exchange and communication to provide intelligent recognition, positioning, monitoring, and management. With the advent of the Internet of things (IoT), Internet connections now extend to the physical objects that are not computers in the classical sense and actually serve many other purposes [46, 47].

The purpose of the Internet of things (IoT) is to ensure that things are connected to anything, any place, any person, any way/network, and any service in an ideal way. With the Internet of things (IoT), three main reasons are (1) a common understanding of users and devices, (2) software architects, and (3) distributed communication networks for processing and communicating where contextual information is relevant, providing analytical tools aimed at autonomous and intelligent behavior. With these three main reasons, intelligent connection and context sensitive calculation can be realized. The convergence of wired and wireless control, communications and information technologies that connect many new technologies, various subsystems, and those operating under a jointly managed and intelligently controlled platform is concerned with the Internet of things (IoT) (**Figure 7**) [48–50].

2.10. Online videos

Considering the increase in online education, it is important that students have easier access to video content and user familiarity. It is about the participation and use of video content and achievements of students and instructors in video environments. Online videos have the same content and subject matter as lesson conferences, labs, assignments, and
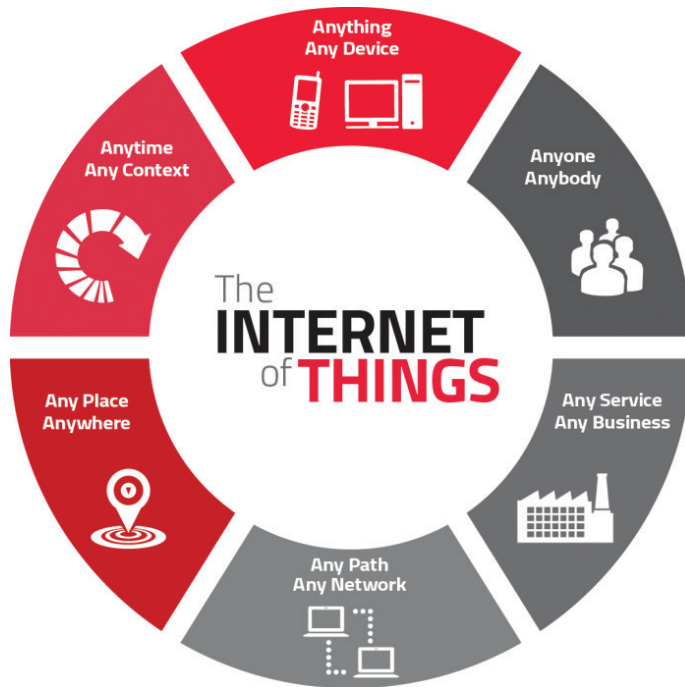
Figure 7. Internet of things (IoT) [51].

exams. In addition, online videos are portable so that a student can connect at anytime. The student can work at this rate at the speed of individual learning. Course processing method is slower and step by step than classroom courses [52, 53]. Video material can be used to enhance learning resources by showing real-life scenarios, explaining concepts, observing social groups, and acting as triggers for discussion. They can also bring learners' expertise and perspectives into their learning experience and inspire them to debate and learn by bringing them to life [54].

Although the impact of video and multimedia technologies on educational output is an ongoing research area, the pedagogical impact of a video can be summarized in three basic concepts [55]:

1. Interaction with content (the student is interested in visual content, orally, taking notes or thinking or applying concepts).

2. Engagement (the student is connected to the visual content, whether it is voluntary or real time, drawn by the video).

3. Knowledge transfer and memory (student concepts can be better remembered and retained in other teaching contexts).

3. Conclusion

This study tried to give information about the current status of e-learning. Although the concept of e-learning has become a new concept in the field of education, it has made rapid progress. In addition to the rapid progress of e-learning, many new concepts have also gained a lot of literature. These concepts are listed in this study as follows: artificial intelligence, micro credential, big data, virtual and empowered reality, blended learning, cloud e-learning, gamification, mobile learning, Internet of things, and online video. These new e-learning trends are explained in this study. In addition, the innovations provided by learners to e-learning environments are explained.

Each of the e-learning environments comes to the forefront with its different features. These concepts are included in the literature under different study titles. But looking at the literature, it is seen that the new trends in e-learning progress step by step. Each new trend actually supports the e-learning environment. For example, with blended learning, online learning and classroom learning are taught. In this way, learners' perception of their learning functions in the most appropriate environment is ensured [56, 57]. Cloud e-learning environment is used to support e-learning environments. e-Learning environments enable identity management, services, data security, application, and resources to be controlled [58]. New e-learning trends are new concepts that support e-learning with different features in this way. These concepts will quickly take place in education in the coming period.

Researchers in the field of new trends in e-learning can conduct research on ten new topics mentioned. Theoretically, more theoretical studies are observed. So, researchers can be found working in the field of application. New trends support each other as explained in this study. That is why researchers can work with new trends together in a related way. For example, gamification and virtual and empowered reality can work together. Or, artificial intelligence and micro credential issues can work together. It is thought that collaborative work to be done in this way may be more effective. In the new era, researchers can suggest that new e-learning environments should be addressed in education rather than in class applications of e-learning.

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