

# The Perspective of E-learning in Higher Education: A Systematized Review

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## ABSTRACT

**Background:** This study aimed to draw the perspective of e-learning in Iran and the world. In other words, an attempt was made to explore the goals, strategies, obstacles, enablers, and innovations of e-learning in higher education systems of Iran and other countries across the world.

**Methods:** A systematized literature review of domestic and international studies was performed using PRISMA guidelines for data collection. Original studies from Iranian databases (Magiran, IranDoc, Civilica, and Noormags) and international databases (ScienceDirect, Springer, Taylor & Francis, and Sage) were included. Three criteria were considered for selecting the sources: relevance to the topic, date of publication (2004-2019 for domestic, and 2005-2020 for international databases), and credibility of sources. Additionally, comparative data analysis was performed using open and axial coding in Grounded Theory Methodology (GTM).

**Results:** Forty one studies from Iranian databases and 22 from international databases were included. The Iranian research review demonstrated that the principal goals of e-learning were quality, cost reduction, and educational justice. Furthermore, it showed that the applied strategies included instructional design, needs assessment, suitable multimedia, and blended learning. Finally, it was revealed that the innovations were MOOCs. As for the international databases, the research review demonstrated that the principal goal of e-learning was innovation in providing instruction and learning at any time and location. The applied strategies included instructional design, evaluation of educational systems, and an interdisciplinary view of e-learning. Other research findings were also discussed.

**Discussion:** Domestic sources were divided into 20 subcategories with respect to the goals, obstacles, enablers, strategies, and innovations. Based on the same factors, international studies fell into 21 subcategories. Decision makers are recommended to consider these elements in their policies regarding e-learning in higher education. Additional discussions and suggestions are provided within the article.

**Keywords:** E-learning, Perspective, Education, Review, Grounded theory

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## Introduction

Higher education is the principal driving force behind the economic and social development in any country. It has an essential mission of generating knowledge and preparing graduates for leadership and responsibility in a complex, competitive, and ever-changing world. Most universities use strategies such as quality assurance to excel their rivals. Therefore, universities must look for ways to provide quality education using the latest technologies (1). E-learning has the potential to overcome the barriers such as geographical distance and time constraints that have led to the poor quality of education in many countries. In this regard, higher education systems, as the highest educational bodies in any country, have proposed e-learning and virtual universities as an alternative or complement to traditional learning (2). In other words, the web and e-learning are powerful global media for teaching and learning in higher education (3). E-learning is defined as: “an innovative approach for delivering a well-designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime by utilizing the attributes and resources of various digital technologies along with other forms of learning materials suited for an open, flexible, and distributed learning environment” (4).

Although e-learning helps with the advancement of instruction and teaching in higher education, scholars have highlighted its challenges in higher education contexts (5). They have identified five main categories of e-learning challenges, which are university-related, professor-related, student-related, system-related, and class-related. Findings have shown that virtual education in Iran's higher education faces various challenges and has yet to reach the optimal conditions and improve its quality (6). Moreover, other researchers have focused on the quality of e-learning in higher education and reported that the quality of e-learning in their case was above average. Still, there were differences in the quality of services, and more efforts were

needed to improve the courses (1). Over the past decades, e-learning research worldwide has developed with regard to teaching practices and examining the obstacles to e-learning implementation, but there are still some shortcomings about the usability of e-learning systems (7).

Furthermore, although examining the obstacles to e-learning has grown in recent years, e-learning research after the global pandemic (i.e., COVID-19) has grown much more rapidly because many universities were compelled to offer their courses on online platforms (8). For example, some studies focused on the challenges of e-learning during COVID-19, such as the challenges involving the readiness of university teachers and officials (9). Some research findings have focused on the inappropriate use of instructional design and demonstrated that universities face challenges in proper planning, designing, and developing of e-learning (10). Scholars have noted that changing instructional delivery from face-to-face to e-learning is accompanied by logistical challenges (11). Some of them asserted that universities have difficulties, for example, in the areas of e-learning design and implementation after COVID-19 (12). There are original papers that have paid attention to the challenges of assessment in higher education. Research assessments indicate that students' academic performance may be affected by: 1) economic, racial, and resource differences; 2) pandemic anxiety; and 3) teachers' unpreparedness (13). Challenges such as electricity outages, internet connectivity problems, and attitude problems have also been reported in similar studies (14). All of the abovementioned research findings can be summarized as follows: 1) COVID-19 has affected universities, and 2) universities have encountered many e-learning challenges, especially in design, implementation and evaluation.

Although significant research has been conducted on e-learning obstacles and challenges (5-12, 14-16), instructional strategies in e-learning (13, 17-23), and

innovation in e-learning (21, 23-33), to our knowledge, no attempts have yet been made to draw an all-encompassing perspective of e-learning (i.e., goals, obstacles, enablers, strategies, and innovation) in international studies in general and in Iran in particular. In other words, the studies in the literature have generally focused on only one aspect of e-learning. In this regard, the originality of the present study lies in the fact that it collected, analyzed, and summarized e-learning research findings, which could provide a whole picture and perspective of e-learning in a way that policymakers and planners can use them in their decisions. Indeed, this systematized review focused not only on the e-learning challenges, obstacles, strategies, and innovations, but also on the goals and enablers, as well as all the components necessary to draw a fruitful perspective of e-learning for policymakers, planners, and managers. Furthermore, this study analyzed the differences between domestic and international research. In this regard, this systematized review aimed to address the following two questions:

- 1) What is the perspective of e-learning in Iran's higher education?
- 2) What is the perspective of e-learning in the world's higher education?

## Methods

This study was a systematized literature review of domestic and international studies, using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for selecting data. The PRISMA search flow diagram and PRISMA checklist items with slight changes were used (34). In addition, in this study, Strauss

and Corbin's GTM was used for coding and analysis.

## Search Strategy

In the review of research conducted in Iran, the searched databases included Magiran, IranDoc, Civilica, and Noormags and educational technology journals. We used these databases because the articles in these databases, which have an enormous volume of e-learning-related content, were relevant to our research topic. In addition, part of the search was in the form of searches in specific journals, taken from some articles' references due to their high abundance and relevance to the research topic and rich data. Table 1 illustrates the keywords used to search the domestic databases.

A complete electronic search strategy for at least one database regarding internal studies according to the PRISMA 2009 checklist is presented in Figure 1.

Furthermore, in this study, ScienceDirect, Springer, Taylor & Francis, and Sage databases were used to review international research. We used these databases because their articles were relevant to our research topic. These databases have an enormous volume of articles related to e-learning. Keywords for the searches were identical with those used to search the domestic databases (Table 1). A complete electronic search strategy for at least one database regarding international studies according to the PRISMA 2009 checklist is presented in Figure 2.

## Inclusion Criteria

We had three precise criteria for the inclusion and exclusion of each article in the review process of research conducted in Iran.

**Table 1.** Keywords used to search the domestic databases

Concept number	Keyword	Keyword variation
1	E-learning	Or electronic learning
2	E-learning Goals	Or E-learning objective
3	E-learning Barriers	Or E-learning challenges
4	E-learning Enablers	Or E-learning empowerment
5	E-learning Strategies	Or E-learning tactics
6	E-learning Innovation	Or E-learning new technologies

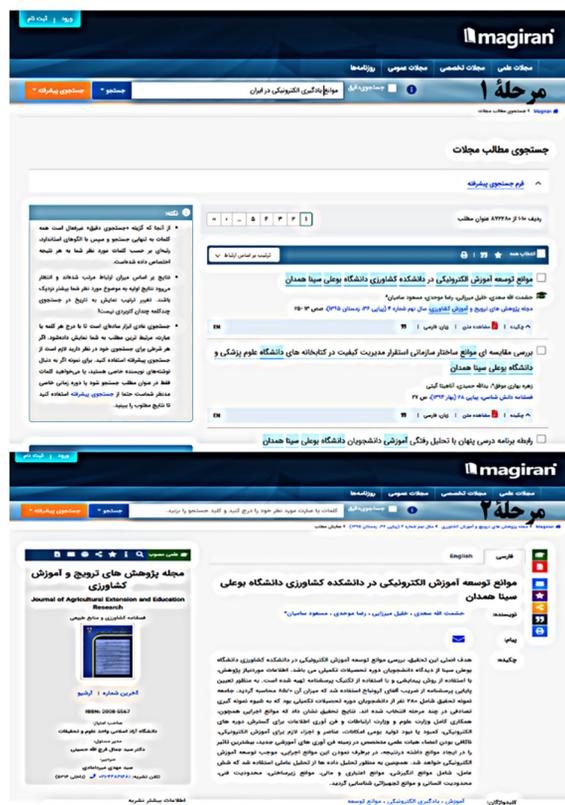


Figure 1. Electronic search strategy for at least one domestic database

These three inclusion criteria included relevance to the research subject (i.e., having perspective elements in the title or abstract), valid journals and sources, and articles published between 2004-2019. The reason for this period was that before 2004, there were no meaningful works regarding e-learning.

After reviewing the topics and articles in the first review, if any of the above three criteria were violated, the selected article would be discarded and excluded from the review. The inclusion and exclusion process is presented in this article's diagram of the selection and extraction of resources for review. Notably, the search date for research conducted in Iran was on March 20, 2020 (Figure 3).

Furthermore, we had three precise criteria for including each article in the review process of international research. These three criteria included relevance to the topic, relevance from 2005 to 2020, and credible journals and sources. With the reviews of the issues and articles in the first review, the

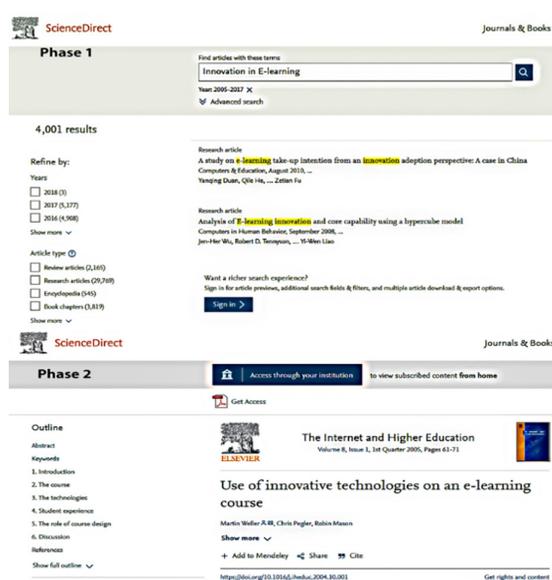


Figure 2. Electronic search strategy for at least one international database

selected articles would be excluded if any of the above three criteria were violated. The inclusion/exclusion process of resources is presented in Figure 4.

### Selection Process of Studies

After the removal of duplicates, the titles and abstracts of the remaining records (for national studies, N=95 and international studies, N=107) were screened independently by two authors according to the inclusion criteria and the research questions. Thirty-one records in the section of national studies and 60 records in the section of international studies were excluded (for national studies, N=64 and for international studies, N=47). The full-text of the included papers (for national studies, N=64 and for international studies, N=47) was reviewed independently by two authors. Finally, after discussion and decisions based on consensus, 41 papers from domestic databases (Persian or English) and 22 papers from international databases (English) were used for final analysis (for national studies, N=41 and for international studies, N=22) (Figures 3 and 4).

### Data Extraction

Data analysis has been analyzed based on Glaser, Strauss, and Corbin grounded theory.

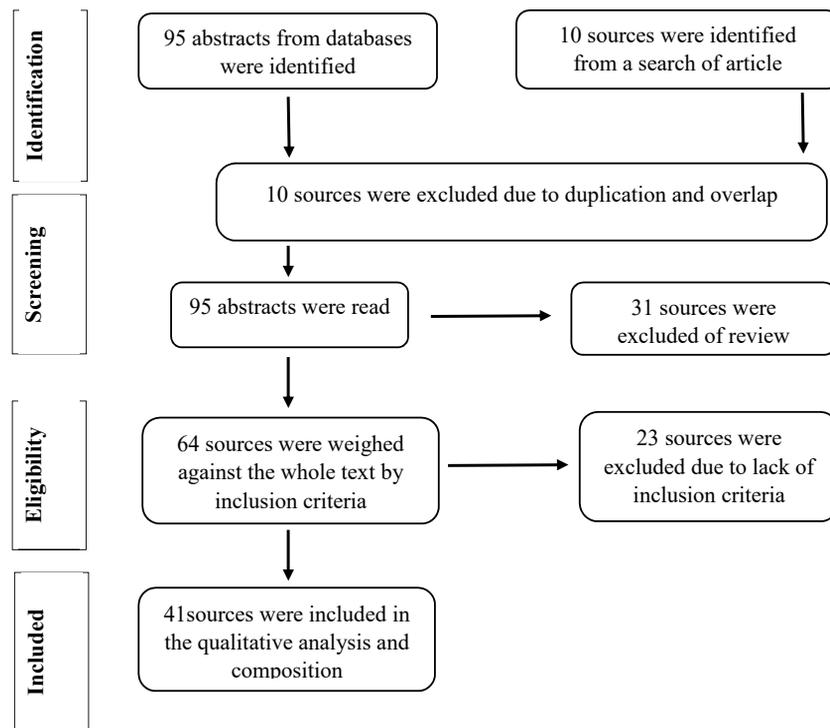


Figure 3. Flow diagram of the inclusion and exclusion of resources for review of the internal research

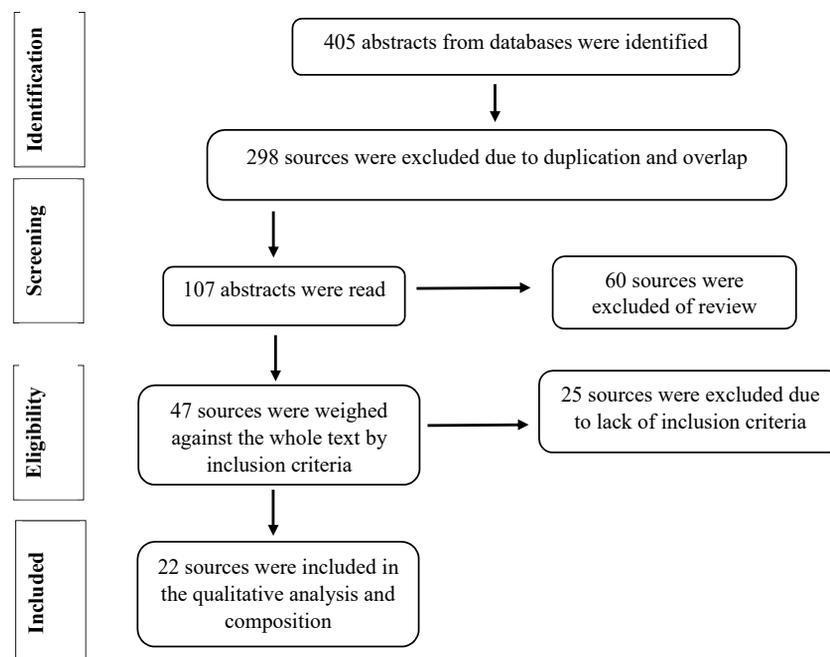


Figure 4. Flow diagram of the inclusion and exclusion of resources for the international research

Glaser represents the classical GTM and, unlike the systematic GTM version of Strauss and Corbin, does not emphasize a particular paradigm in coding. It also highlights the creative mind and allows data for the emergence of new theories (35). There are different ways of coding in grounded theory

methodology. Coding in grounded theory methodology is a process of conceptual abstraction by assigning general concepts (codes) to singular incidences in the data. After considering included studies, open and axial coding was used based on our research questions. In the first step of open coding,

the data are broken up into smaller parts that are deeply analyzed. This analysis aims to grasp the core idea of each part and to develop a code to describe it. In a second step, these smaller analytical parts are compared concerning similarities and differences. Similar parts can be labeled with the same code. The overall goal of open coding was to develop a wealth of codes with which the data are described. Finally, axial coding is needed to investigate the relationships between concepts and categories developed in the open coding process. In this step, concepts need to be integrated into an overarching framework with one core category, and authors used the subcategories of the e-learning perspective as a framework (Tables 2 and 3). In other words, the data are first broken up in the open coding process, and then they are joined together in a new fashion in the axial coding process as links are established between categories and their subcategories. To sum up, the research method starts first with the PRISMA guidelines, and second, uses Strauss and Corbin's guidelines in the grounded theory for analyzing and reporting.

## Results

E-learning as a new and cost-effective medium for learning and instruction has drawn scholars' attention, so it has led to conducting many studies. Therefore, drawing the perspective of e-learning is essential to help policymakers and scholars attain a big picture of this medium. Forty-one original research in the Iranian databases, and 22 original research were included in this research. This systematic review aimed to investigate the perspective of e-learning in Iran and the world. In this regard, the perspective of e-learning in Iran's higher education and the perspective of e-learning in the world's higher education have been analyzed and considered.

Question 1. What is the perspective of e-learning in Iran's higher education?

As Table 2 shows, in the goal dimension, quality creating, reducing cost, and educational justice-making are addressed.

However, data on the goal dimension are also scarce, indicating that more research is needed in the future to identify the purpose of e-learning in Iran. Besides, in the section on barriers, weak management, weak design, weak access, weak culture, weak financial resources, weak systems, and weak language have been identified as the main barriers to e-learning, and decision-makers must make appropriate decisions accordingly. In the enablers section, appropriate hardware and software infrastructure, appropriate policies, outstanding professors, appropriate attitude, and skilled students have been reported as enablers in most research. In the strategies section, as presented in Table 2, the primary strategies include instructional design, instructional needs assessment, appropriate multimedia, and blended learning. Instructional design is one of the following instructional technology topics, which includes many elements and components that can be seen in the data. As the findings of this study show, little research has been done in Iran in the section of innovations. Most researchers have not paid enough attention to the innovations that are occurring in this field. This finding confirms that attention to and monitoring of innovations have not been unfortunately considered in national research. Only two studies reported massive open online courses (MOOCs) as an innovation while witnessing the emergence of new technologies and innovations in this field.

Question 2. What is the perspective of e-learning in the world's higher education?

The purpose of the international research review was to understand the findings and their research trends. As Table 3 shows, international studies have focused on goals, barriers, enablers, strategies, and innovations. Table 3 shows that the goals of e-learning are innovation in providing education and learning in any place and time. The obstacles are weak instructional design, lack of attention to learners' needs, weak infrastructure, and cultural problems. Based on Table 3, the main enablers include appropriate hardware and software infrastructure,

**Table 2.** Data analysis of internal research with axial coding

Resources	Subcategories	The Main Category
Mahdioun, Shabani, & Sadeghi (2013), Jafarpour (2011), Motavvar, Aliabadi, Mozayyani, Delavar, & Nili (2016)	Create Quality, reduce costs, create educational justice	Goals
Feizi, & Rahmani (2003), Sadi, Mirzaee, Movahedi, & Samian (2016), Musavi, Mohammadzadeh, NasrAbadi, & Pezeshkirad (2010), Esmaeeli, Rahmani, Kazemi, & Aliahmadi (2015), Zare, & Sarikhani (2015), Jafari, Fathivajargah, Arefi, & Rezaezadeh (2017), Rasouli, Alaiabadi, & Moradi (2014), Hodavand, Moshirzadeh, & Raeesi (2011), Mahmoudi, & Mostashiri (2016), Naderifar, Ghaljaee, Jalalodini, Rezaee, & Salar (2015), Karami, Ahanchian, Ebrahimi, & Koushakhmehdi (2011), Rahimidous (2006), Motavvar, Aliabadi, Mozayyani, Delavar, & Nili (2017), Majidi (2009)	Weak management, weak design, weak access, weak culture, weak financial resources, weak systems, weak language	Obstacles
Feyzi, & Rahmani (2002), Nourollahi, Hakimzadeh, & Seraji (2011), Abbasikiani, & Mourkani (2018), Rafeee, Ghaffari, & Khorrami (2017), Khosravi, Baratdastjerdi, & Amirteimouri (2014), Smaeelnia, Kouhestani, & Maghoul (2019), Jafari, Fathivajargah, Arefi, & Rezaeezadeh (2018), Momenirad, & Aliabadi (2010), Mahdiyoun, Shabani, & Sadeghi (2014), Rasouli, Aliabadi, & Moradi (2015), Hodavand, Moshirzadeh, & Raeesi (2012), Abili, Narenjisani, & Mostafavi (2018), Ghazanfari, & Badeleh (2018), Jafarpour (2012), Naderifar, Ghaljae, Jalodini, Rezee, & Salar (2016), Ghorbankhani, & Salehi (2017), Borjalilou, Mohammadi, & Mojtahedzadeh (2013), Rahimidoust, & Razavi (2012), Rezaee, Naderi, Tarin, & Jafari (2017), Salari, & Karami (2014), Rahimidoust (2007), Glzari, Kiamanesh, Ghourchain, & Jafari (2013), Moinikia, Zahedbolbolan, Arianigizgapan, & Bidgeli (2019), Rahimi, Shahin, & Aghababae (2014), Mojtahedzadeh, Ebrahimzadeh, Zandi, Sarmadi, & Alipour (2011), Rahmani, Ahmadi, Ghanbari, & Khorasaniekiasari (2019), Zareezavaraki, Arigh, & Rastgar (2010), Khatibzanjani, Zandi, Farajollahi, Sarmadi, & Ebrahimzadeh (2011), Majidi (2009), Zamani, & Madani (2011)	Appropriate hardware and software infrastructure, appropriate policies, outstanding professors, appropriate attitude, skilled student	Enablers
Musavi, Mohammadzadeh, Nasrabadi, & Pezeshki (2011), Smaeelnia, Kouhestani, & Maghoul (2019), Rasouli, Aliabadi, & Azadiparand (2016), Yaghoubi, Malekmohammadi, Irvani, Attaran (2008), Jafari, Fathivajargah, Arefi, & Rezaeezade (2019), Taghizadeh, Hatami, & Ghasemi (2018), Zamani, & Madani (2011)	Instructional design, instructional needs assessment, appropriate multimedia, blended learning,	Strategies
Jafari, & Fathivajarah (2018), Motavvar, Aliabadi, Mozayyani, Delavar, & Nili (2017)	Massive Open Online Course (MOOC)	Innovations

**Table 3.** Data analysis of international research with axial coding

Resources	Subcategories	The Main Category
Rodriguez, Almida, Figueroa, and Lopez (2019), Bartit, Gozek, John, Barnighausen, George and Newhan (2020), Trussas, Kruska and Esgropulova (2020), Vanitha, Krishnan, & Elakkiya (2019), Sinkoin, Guillotine and Sao Zone (2019), Mehta, Morris, Swinerton and Homer (2019), Nabizadeh, Ganchaluz, Gamma, George and Rafsanjani (2020)	Innovation in providing education, learning in any place and time	Goals
Choudhury, & Pattnaik (2020), Sinkoin, Guillotine and Sao Zone (2019), Nabizadeh, Ganchaluz, Gamma, George and Rafsanjani (2020), Radianti, Majchrzak, Fromm, & Wohlgenannt (2020)	Weak instructional design, lack of attention to learners' needs, weak infrastructure, cultural problems	Obstacles
Choudhury, & Pattnaik (2020), Fandino, Munoz, & Velandia (2019), Fraihat, Joy, Masadeh, & Sinclair (2020), Nikoli, Kaljevic, Jović, Petković, Milovančević, Dimitrov, & Dachkinov (2018), Cheng, & Yuen (2019), Vanitha, Krishnan, & Elakkiya (2019), Hong, Tsai, Hsiao, Chen, Chu, Gu, & Sithiworachart (2019), Herodotou, Rienties, Boroowa, Zdrahal, & Hlostá (2019), Sinkoin, Guillotine and Sao Zone (2019), Philipsen, Tondeur, Roblin, Vanslambrouck, & Zhu (2019), Mayer (2019), Mehta, Morris, Swinerton and Homer (2019), Leeuwen (2018), Nabizadeh, Ganchaluz, Gamma, George and Rafsanjani (2020), Radianti, Majchrzak, Fromm, & Wohlgenannt (2020), Saubern, Urbach, Koehler, & Philips (2020)	Appropriate hardware and software infrastructure, Skilled student, Professional development of teachers, Application of educational innovations, Appropriate culture in the environment	Enablers
Bartit, Gozek, John, Barnighausen, George and Newhan (2020), Choudhury, & Pattnaik (2020), Fraihat, Joy, Masadeh, & Sinclair (2020), Nikoli, Kaljevic, Jović, Petković, Milovančević, Dimitrov, & Dachkinov (2018), Trussas, Kruska and Esgropulova (2020), Herodotou, Rienties, Boroowa, Zdrahal, & Hlostá (2019), Sinkoin, Guillotine and Sao Zone (2019)	Instructional design, evaluation of instructional systems, interdisciplinary view of e-learning	Strategies
Rodriguez, Almida, Figueroa and Lopez (2019), Fraihat, Joy, Masadeh, & Sinclair (2020), Dalim, Sunar, Dey, & Billingham (2019), Trussas, Kruska and Esgropulova (2020), Vanitha, Krishnan, & Elakkiya (2019), Weller, Pegler, & Mason (2005), Herodotou, Rienties, Boroowa, Zdrahal, & Hlostá (2019), George, & Lal (2019), Leeuwen (2018), Nabizadeh, Ganchaluz, Gamma, George and Rafsanjani (2020), Saubern, Urbach, Koehler, & Philips (2020)	Massive Open Online Course (MOOC), Learning analytics, New Learning Management Systems, New Algorithms for Personalizing the Learning Path, Virtual Reality, Augmented Reality, Use of Artificial Intelligence	Innovations

skilled students, professional development of teachers, application of educational innovations, and appropriate culture in the environment. Table 3 also shows that the main strategies in the international research findings are instructional design, evaluation of instructional systems, and an

interdisciplinary view of e-learning. Finally, according to Table 3, in the innovation dimension, major innovations are massive Open Online Courses (MOOCs), learning analytics, new learning management systems, new algorithms for personalizing the learning path, virtual reality, augmented reality, and

artificial intelligence.

## Discussion

In this systematized review article, we used a review protocol along with Strauss and Corbin's GTM to analyze, summarize, and synthesize Iranian studies and international studies to not only draw the perspective of e-learning in Iran and the world, but also identify the similarities and differences between the perspective of e-learning in Iran's higher education and the world's.

First, this paper demonstrates that in the goal dimension, subcategories derived from national studies, include quality, cost reduction, and educational justice. In addition, subcategories derived from international studies include innovation in providing education and learning anywhere and anytime. These findings are in line with previous studies (7, 19, 20) reporting that the goals of e-learning are to provide new technology for teaching and improve quality. As can be deduced, the results obtained from national and international research are different from each other in the goal dimension. In fact, international research has reported that the purpose of e-learning is to provide innovation and learning at any place and time, while Iranian research has not mentioned these cases. It reminds us of another goal of e-learning.

Second, this review revealed that in the dimension of obstacles, subcategories derived from national studies include weak management, weak instructional design, weak access, weak culture, weak financial resources, weak systems, and weak language. In the dimension of barriers, subcategories derived from international research also include weak instructional design, lack of attention to learners' needs, weak infrastructure, and cultural problems. These findings are in line with previous studies (5, 6, 8) reporting that some of the obstacles to any e-learning system's success are weak instructional design, lack of attention to learners' needs, weak infrastructure, and cultural problems. Those studies' results are different from the

findings of this study in the section of the Iranian studies because this study reported weak language as one of the obstacles to the success of e-learning. This difference might be due to English, which is a foreign language to Iranian e-learning stakeholders. As can be deduced from the dimension of obstacles, the categories of weak instructional design, weak culture, and weak infrastructure are expected in Iranian and international studies, while not paying attention to the needs of learners is a vital subcategory that is often mentioned in international research, and it does not exist in national studies.

Third, the results have shown that subcategories derived from national studies include appropriate hardware and software infrastructure, appropriate policies, outstanding professors, appropriate attitude, and skilled students in the enablers dimension. In the same dimension, subcategories derived from international research also include appropriate hardware and software infrastructure, skilled students, professional development of teachers, application of educational innovations, and the appropriate culture in the environment. These findings are in line with previous studies (16, 22) reporting that enablers of e-learning include appropriate hardware and software infrastructure, professional development of teachers, application of educational innovations, and the appropriate culture in the environment. The differences between these studies and this study are in the elements, such as outstanding professors and an appropriate attitude. These differences might be due to distinguished professors who have an appropriate attitude towards e-learning, possibly due to the appropriate employment system. The enablers dimension between Iranian and international research include appropriate hardware and software infrastructure and skilled students, while in international studies, other vital subcategories such as professional development of teachers, application of educational innovations, and appropriate culture in the environment have been obtained and should be considered

according to the context of Iran's higher education.

Fourth, this review demonstrated that subcategories derived from national studies include instructional design, instructional needs assessment, appropriate multimedia, and blended learning in the section of strategies. In the strategy dimension, subcategories derived from international studies include instructional design, evaluation of instructional systems, and an interdisciplinary view of e-learning. These findings are in line with previous studies (17, 36-40) reporting that instructional design is an essential factor in the success of e-learning environments. As can be deduced, two important subcategories in international research have been extracted that have had little reference in Iranian research. These two subcategories are the evaluation of educational systems and the interdisciplinary view of e-learning. These two subcategories should be further explored in Iran and may be essential strategies to promote Iran's e-learning.

Fifth, finally, in the dimension of innovations, subcategories derived from national research include only MOOCs. This finding is in line with previous studies (28, 41) that reported MOOCs as an essential innovation in the e-learning evolution. It must be noted that MOOCs mentioned in the internal investigations are based on other countries' innovations, not Iran. In the dimension of innovations, importantly, the results revealed that subcategories derived from international research include MOOCs, learning analytics, new learning management systems, new algorithms for learning path personalization, virtual reality, augmented reality, and artificial intelligence. As can be seen, in international studies, the emphasis on innovation is much greater, and these innovations are learning analytics, new learning management systems, new algorithms for personalizing the learning path, virtual reality, augmented reality, and artificial intelligence in e-learning. Innovations such as instructional software,

an important part of e-learning, should also be considered (42).

In conclusion, as this paper shows, there were not some subcategories in the perspective of e-learning in Iran's higher education compared to international research findings on e-learning. These subcategories are: a) innovation and learning in any place and time; b) the needs of learners; c) the professional development of teachers, the application of educational innovations, and appropriate culture in the environment; d) evaluation of educational systems and interdisciplinary view of e-learning; e) learning analytics, new learning management systems, new algorithms for learning path personalization, virtual reality, augmented reality, and artificial Intelligence. It is, therefore, essential that decision-makers and policymakers consider these issues in their decisions and policies. Furthermore, researchers can focus on those subcategories to clarify how those subcategories can be useful for e-learning in Iran in the future. In addition, in the innovation part, which is also considered important in the goal section, researchers can conduct research to examine each of these innovations (i.e., learning analytics, new learning management systems, new algorithms for personalizing the learning path, virtual reality, augmented reality, and artificial intelligence) as well as future innovations. Finally, it must be noted that limiting research to 2019 and 2020 can be mentioned as a limitation of this research. In addition, failure to use the Scopus and SID databases can be considered as research limitations.

### **Ethical Considerations**

There were not any ethical issues in this research.

### **Authors' Contributions**

S. J. M. devised the study concept, designed the study, supervised the systematic review, and finally revised the manuscript. M.Sh. Collected data, analyzed data, and drafted the manuscript.

### Availability of Data and Materials

Open coding data are not available in this text, and all open coding data in the table format will be accessible in the appendix file.

### Conflict of Interest

The authors declare that they have no conflict of interest.

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### References

- 1 Papadimitriou, A. Beyond rhetoric: reinventing the public mission of higher education. *Tert Educ Manag* 26, 1–4 (2020). doi:10.1007/s11233-019-09046-9
- 2 Ellis RA, Ginns P, Piggott L. E-learning in higher education: some key aspects and their relationship to approaches to study. *Higher Education Research & Development*. 2009 June 1;28(3):303-18. doi:10.1080/07294360902839909
- 3 Khan BH, editor. *Web-based instruction*. Educational Technology; 1997.
- 4 Khan BH, editor. *Managing e-learning: Design, delivery, implementation, and evaluation*. IGI Global; 2005. doi:10.4018/978-1-59140-634-1
- 5 Shafiei Sarvestani M, Mohammadi M, Afshin J, Raeisy L. Students' experiences of e-learning challenges; a phenomenological study. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*. 2019 September 1;10(3):1-0. doi:10.30476/IJVLMS.2019.45841
- 6 Islam N, Beer M, Slack F. E-learning challenges faced by academics in higher education. *Journal of Education and Training Studies*. 2015;3(5):102-12. doi:10.11114/jets.v3i5.947
- 7 Rodrigues H, Almeida F, Figueiredo V, Lopes SL. Tracking e-learning through published papers: A systematic review. *Computers & Education*. 2019 July 1;136:87-98. doi:10.1016/j.compedu.2019.03.007
- 8 Aini Q, Budiarto M, Putra PO, Rahardja U. Exploring E-learning Challenges During the Global COVID-19 Pandemic: A Review. *Jurnal Sistem Informasi*. 2020 Oct 31;16(2):57-65. doi:10.21609/jsi.v16i2.1011
- 9 Molchanova E, Kovtoniuk K, Savych O. Covid-19 Presents New Challenges and Opportunities to Higher Education. *Revista Romaneasca pentru Educatie Multidimensionala*. 2020 Sep 7;12(2Sup1):168-74. doi:10.18662/rrem/12.2Sup1/303
- 10 Adedoyin OB, Soykan E. Covid-19 pandemic and online learning: the challenges and opportunities. *Interactive Learning Environments*. 2020 Sep 3:1-3. doi:10.1080/10494820.2020.1813180
- 11 Aboagye E, Yawson JA, Appiah KN. COVID-19 and E-learning: The challenges of students in tertiary institutions. *Social Education Research*. 2020 Jul 22:1-8. doi:10.37256/ser.122020422
- 12 Almaiah MA, Al-Khasawneh A, Althunibat A. Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*. 2020 May 24:1. doi:10.1007/s10639-020-10219-y
- 13 Ribeiro R. How university faculty embraced the remote learning shift. *EdTech Magazine*. 2020.
- 14 Shrestha RM, Shrestha S, Acharya A, Gupta A. Online Education Status at Dental Colleges During COVID-19 Pandemic in Nepal. *Kathmandu University Medical Journal*. 2020 Nov 17;18(2):15-20. doi:10.3126/kumj.v18i2.32939
- 15 Fattahi, M., Roshani ali bene see, H., Heydari, S., Shahalizadeh, M., Roshani ali bene see, H., EIC, P. Implementation Pathology of the E-learning Curriculum in Iran (Case Study Shahid Beheshti

- University of Tehran). *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 2016; 7(2). doi:10.5812/IJVLMS.12157
- 16 Van der Spoel I, Noroozi O, Schuurink E, van Ginkel S. Teachers' online teaching expectations and experiences during the Covid19-pandemic in the Netherlands. *European journal of teacher education*. 2020 August 7;43(4):623-38. doi:10.1080/02619768.2020.1821185
  - 17 Shahalizade, M., Mozaffari, R., Ahmadigol, J., Roshani Ali Bene See, H. The Effect of Peer Feedback and Formative Feedback on the Design and Production of the Instructional Project. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 2019; 10(3): 42-48. doi: 10.30476/ijvlms.2019. doi:10.30476/IJVLMS.2019.45864
  - 18 Fattahi M, Roshani Ali Bene See H, Heydari S, Shahalizadeh M. Implementation Pathology of the E-learning Curriculum in Iran (Case Study Shahid Beheshti University of Tehran). *Interdisciplinary Journal of Virtual Learning in Medical Sciences*. 2016 June 1;7(2). doi:10.5812/IJVLMS.12157
  - 19 Barteit S, Guzek D, Jahn A, Bärnighausen T, Jorge MM, Neuhaus F. Evaluation of e-learning for medical education in low-and middle-income countries: A systematic review. *Computers & Education*. 2020 Feb 1;145:103726. doi:10.1016/j.compedu.2019.103726 PMID:32565611 PMCID:PMC7291921
  - 20 Choudhury S, Pattnaik S. Emerging themes in e-learning: A review from the stakeholders' Perspective. *Computers & Education*. 2020 January 1;144:103657. doi:10.1016/j.compedu.2019.103657
  - 21 Al-Fraihat D, Joy M, Sinclair J. Evaluating E-learning systems success: An empirical study. *Computers in Human Behavior*. 2020 January 1;102:67-86. doi:10.1016/j.chb.2019.08.004
  - 22 Nikolić V, Kaljević J, Jović S, Petković D, Milovančević M, Dimitrov L, Dachkinov P. Survey of quality models of e-learning systems. *Physica A: Statistical Mechanics and its Applications*. 2018 Dec 1;511:324-30. doi:10.1016/j.physa.2018.07.058
  - 23 Troussas C, Krouska A, Sgouropoulou C. Collaboration and fuzzy-modeled personalization for mobile game-based learning in higher education. *Computers & Education*. 2020 January 1;144:103698. doi:10.1016/j.compedu.2019.103698
  - 24 Noroozi O, Pijera-Díaz HJ, Sobocinski M, Dindar M, Järvelä S, Kirschner PA. Multimodal data indicators for capturing cognitive, motivational, and emotional learning processes: A systematic literature review. *Education and Information Technologies*. 2020 Nov;25:5499-547. doi:10.1007/s10639-020-10229-w
  - 25 Rodrigues H, Almeida F, Figueiredo V, Lopes SL. Tracking e-learning through published papers: A systematic review. *Computers & Education*. 2019 July 1;136:87-98. doi:10.1016/j.compedu.2019.03.007
  - 26 Dalim CS, Sunar MS, Dey A, Billingham M. Using augmented reality with speech input for non-native children's language learning. *International Journal of Human-Computer Studies*. 2020 Feb 1;134:44-64. doi:10.1016/j.ijhcs.2019.10.002
  - 27 Vanitha V, Krishnan P, Elakkiya R. Collaborative optimization algorithm for learning path construction in E-learning. *Computers & Electrical Engineering*. 2019 July 1;77:325-38. doi:10.1016/j.compeleceng.2019.06.016
  - 28 Weller M, Pegler C, Mason R. Use of innovative technologies on an e-learning course. *The Internet and Higher Education*. 2005 Jan 1;8(1):61-71. doi:10.1016/j.iheduc.2004.10.001
  - 29 Herodotou C, Rienties B, Boroowa A, Zdrahal Z, Hlosta M. A large-scale implementation of predictive learning analytics in higher education: the teachers' role and Perspective. *Educational Technology Research and Development*. 2019 October 1;67(5):1273-306. doi:10.1007/s11423-019-09685-0
  - 30 George G, Lal AM. Review of

- ontology-based recommender systems in e-learning. *Computers & Education*. 2019 December 1;142:103642. doi:10.1016/j.compedu.2019.103642
- 31 Van Leeuwen A. Teachers' perceptions of the usability of learning analytics reports in a flipped university course: when and how does information become actionable knowledge?. *Educational Technology Research and Development*. 2019 October 1;67(5):1043-64. doi:10.1007/s11423-018-09639-y
- 32 Nabizadeh AH, Gonçalves D, Gama S, Jorge J, Rafsanjani HN. Adaptive learning path recommender approach using auxiliary learning objects. *Computers & Education*. 2020 April 1;147:103777. doi:10.1016/j.compedu.2019.103777
- 33 Radianti J, Majchrzak TA, Fromm J, Wohlgenannt I. A systematic review of immersive virtual reality applications for higher education: Design elements, lessons learned, and research agenda. *Computers & Education*. 2020 April 1;147:103778. doi:10.1016/j.compedu.2019.103778
- 34 Moher D, Liberati A, Tetzlaff J, Altman DG, Prisma Group. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS med*. 2009 Jul 21;6(7):e1000097. doi:10.1371/journal.pmed.1000097 PMID:19621072 PMCID:PMC2707599
- 35 Farasatkah M. Qualitative research method in social sciences with an emphasis on the grounded theory. *Agah publication*. 2016 Nov 1, 96-97.
- 36 Hart JE. Importance of instructional designers in online higher education. *The Journal of Applied Instructional Design*. 2020;9(2). <https://dx.doi.org/10.51869/92jeh>
- 37 Sharpe R, Oliver M. Designing courses for e-learning. *Rethinking pedagogy for a digital age: Designing and delivering e-learning*. 2007 Apr 19:41-51.
- 38 Hussin H, Bunyarit F, Hussein R. Instructional design and e-learning: Examining learners' Perspective in Malaysian institutions of higher learning. *Campus-Wide Information Systems*. 2009 January 2. doi:10.1108/10650740910921537
- 39 Zheng L, Smaldino S. Key instructional design elements for distance education. *Quarterly Review of Distance Education*. 2003;4(2):153-66.
- 40 Van Merriënboer J, Bastiaens T, Hoogveld A. Instructional design for integrated e-learning. *Integrated e-learning: Implications for pedagogy, technology, and organization*. 2004 Mar 1:13-23.
- 41 Flynn JT. MOOCs: Disruptive innovation and the future of higher education. *Christian Education Journal*. 2013 May;10(1):149-62. doi:10.1177/073989131301000112.
- 42 Shahalizade, M. An Introduction to Adobe Flash Professional CS5 to Produce Multimedia Animation and Electronic Content. *Interdisciplinary Journal of Virtual Learning in Medical Sciences*, 2013; 4(2): 75-82.