Establishing Criteria for an Optimal Online Learning Environment for Iranian University Students: A Qualitative Research Synthesis

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Abstract

The adoption of E-learning in academic environments, particularly in Iran, has accelerated over the past decades. However, the lack of established guidelines for instructional design seems to have hindered the creation of effective online educational environments. Therefore, this study aimed to conduct a comprehensive qualitative research synthesis (QRS) to identify the criteria for an optimal online learning environment for Iranian university students. The study followed Major and Savin-Baden's three-phase QRS model and included 12 studies with 252 participants and 42 researchers. The synthesis integrated findings from multiple studies to gain insights into experts' opinions and students' perceptions, preferences, and experiences within online learning environments. The research identified four overarching themes: targeted learning, effective teaching management, socio-affective engagement, and learner empowerment. Targeted learning focuses on problem-oriented and need-oriented teaching; effective teaching management emphasizes balanced content and time management, clear objectives, and diverse presentation and evaluation methods; socio-affective engagement involves interactive feedback, social presence, and emotional communication; learner empowerment stresses autonomy, agency and active learning, including experiential and discovery learning. Applying these findings seems to offer a genuine contribution, leading to the development of culturally relevant and high-quality E-learning experiences and addressing the challenges posed by the nascent E-learning system in Iran.

Keywords: Standards, E-learning, Learning Environment, Qualitative Research Synthesis

Introduction

E-learning has witnessed remarkable growth in academic environments worldwide due to diverse factors. One prominent catalyst has been the COVID-19 pandemic, necessitating educational institutions to embrace alternative teaching methods. To surmount the challenges posed by the pandemic, universities and colleges have increasingly turned to online and blended learning models (Bao, 2020). E-learning brings about numerous advantages, including heightened flexibility, broader accessibility to education, and the exploration of innovative pedagogical approaches. In the context of Iran, there has been a substantial surge in E-learning across universities, with a majority now offering online programs and courses (Shafiei Sarvestani et al., 2019). Advancements in internet infrastructure, a burgeoning demand for remote and flexible learning options, and the rising population of digitally native students have also contributed to the adoption of E-learning in Iran (Motaghian, 2013).

Despite the numerous advantages of E-learning, it introduces unique challenges that necessitate paying meticulous attention to instructional design and the online learning experience (Simonson, 2019). Within E-learning research and practice, a significant gap exists in established guidelines and standards for efficient online educational resources and environments (Mbati & Minnaar, 2015). This issue is particularly prevalent in Iran, where the E-learning system is still in its nascent stages of development (Lakbala, 2015; Salahshouri et al., 2022). Consequently, instructional designers often face a fragmented landscape, relying on trial and error rather than evidence-based practices (Jabar & Albion, 2016). The absence of any clear criteria addressing the specific needs of students has led to the creation of online resources that inadequately support learning, engagement, and learner satisfaction (Contoni et al., 2004). For Iranian universities, the scarcity of optimized E-learning environments presents significant barriers to the effective adoption and utilization of online delivery modes (Khatoony & Nezhadmehr, 2020). The compilation and utilization of evidence-based and comprehensive standards can cultivate culturally relevant and high-quality e-learning experiences (Jung, 2011). In conclusion, the current landscape calls for a concerted effort to address the lack of guidelines and standards in E-learning, particularly in the Iranian context.

In light of the mentioned challenges, it becomes imperative to conduct a comprehensive review of research that sheds light on the factors contributing to the efficacy and satisfaction of E-learning. Specifically, conducting a review of qualitative literature appears to be

beneficial as it provides valuable insights into student perceptions, preferences, motivations, and experiences within online learning environments (Esra & Sevilen, 2021; Muthuprasad et al., 2021). The extant qualitative studies have, for instance, identified the utilization of pedagogical principles to foster learning and student motivation, as well as the instructor's knowledge and characteristics that impact the effectiveness of E-learning specifically for Iranian students (Zareisaroukolaei et al., 2020). Therefore, synthesizing the key themes and findings from this qualitative body of literature enables the development of optimized and evidence-based guidelines for E-learning that are specific to the needs of the target population.

To this end, we employed qualitative research synthesis (QRS). It is a robust method that integrates and interprets findings from multiple studies and helps to gain fresh insights into the existing literature (Major & Savin-Baden, 2012). By adopting a meta-analytic approach, this methodology enables the analysis of patterns and relationships across studies, resulting in a more comprehensive understanding of a particular phenomenon (Erwin et al., 2011). Qualitative synthesis proves especially beneficial in guiding policy and practice, including quality standards and criteria in the context of E-learning (Dixon-Woods et al., 2006; Snilstveit et al., 2012). Through synthesizing qualitative findings focused on E-learning among Iranian university students, it becomes possible to elucidate essential criteria and best practices for creating customized and effective online educational environments (Abbasi Kasani & Shams, 2018). The derivation of evidence-based standards would effectively address the existing confusion and inconsistencies, equipping instructional designers with a solid and empirically grounded framework to develop E-learning experiences that are engaging and satisfying for learners (Afify, 2018). Accordingly, This qualitative research synthesis presents a valuable approach to guide the development of evidence-based standards for E-learning, thereby enhancing its effectiveness and success within Iranian university contexts.

Establishing clear criteria for E-learning environments based on qualitative research synthesis cannot be overstated. However, the preceding efforts with this goal often have fundamental methodological flaws; for example, researchers have used QRS on quantitative data (e.g., Abbasi Kasani & Shams, 2018). Therefore, the research question guiding this study is: What are the criteria for an optimal online educational environment for Iranian university students based on a synthesis of qualitative research? Answering this question through a sound qualitative research synthesis will distill evidence-based criteria for creating positive E-learning experiences. Utilizing the identified criteria, in turn, has the potential to enhance learning outcomes, satisfaction, and the successful integration of online education within Iranian universities.

Methodology

This study aimed to conduct a comprehensive qualitative research synthesis (QRS) to identify criteria for an optimal online educational environment for Iranian university students. The study followed Major & Savin-Baden's (2010) three-phase QRS model. We chose to move beyond merely describing and compiling primary studies, opting instead for an interpretive approach to qualitative synthesis (Major & Savin-Baden, 2010). This approach enables a more profound comprehension of the subject matter and the current state of affairs. As advocated by Estabrooks et al. (2005), such endeavors hold the promise of advancing theory-building efforts beyond the scope of individual studies.

Study Identification and Selection

To ensure transparency, we offer a comprehensive explanation of our methodology for arriving at the final dataset. To conduct a rigorous investigation, we categorized the search terms into three distinct groups, resulting in 270 alternatives, as outlined in Table 1.

Table 1

Categories for Search Terms

Number	Search Terms	Number
1	standard, quality, framework, guideline, best practice, principle, direction, recommendation, criteria	9
2	computer, online, multimedia, distant, interactive, electronic, MOOC, blended, mobile, virtual	10
3	learning, teaching, education	3

Subsequently, we employed the search terms outlined in Table 1. and their Persian equivalents were then used to identify any relevant study published in Iranian peer-reviewed journals from 2011 onwards. To this end, the most comprehensive Iranian online databases, namely noormags.ir, magiran.com, sid.ir, isc.ac, and ensani.ir, were included in the search process. Since the above databases did not allow for advanced classified searches, the researchers had no choice at their disposal but to insert all 270 alternative search combinations into the five databases manually to obtain the relevant studies. Also, the unit of analysis was the full text for each article.

The primary phase of our qualitative research synthesis yielded a total of 1,057 search results. To ensure a more focused and relevant selection, we proceeded to the second phase, employing a set of exclusion criteria. These criteria encompassed duplicated studies, literature reviews, conference papers, and studies unrelated to our research focus. Following these criteria, we refined the search results, ultimately selecting 99 studies aligned with our research objectives.

Given the lack of consensus regarding the ideal number of studies to include in a qualitative synthesis, our objective was to curate a dataset that was manageable in size and scope. Following the advice of Major and Savin-Baden (2010) to limit the selection to no more than 10 studies, we further refined our selection with another set of exclusion criteria. These criteria encompassed fully quantitative studies, studies lacking originality (i.e., those utilizing pre-existing models for categorization), non-pedagogical studies (i.e., addressing managerial and technical aspects of E-learning instead of pedagogical aspects), and studies conducted in non-academic contexts such as school or work settings. These criteria effectively narrowed down the database to 14 relevant studies.

In the initial stages of the analysis, we identified two additional studies that required exclusion. One study displayed significant overlap with another study conducted by the same authors, which was already included in the database. We excluded the second study as it did not report the qualitative phase of the research. As a result, Table 2 presents the final 12 studies identified and selected for this research. The synthesis included a total of 252 participants and 42 researchers, offering a comprehensive representation of our research endeavor.

Table 2

Description of the Studies Selected for the Present Study

	Authors (Year)	Title	N	Participants	Approach	Collection	Analysis
1	Mahdiuon et al (2014)	A study of an explorative model of quality assurance in university's E-learning institutions	16	E-learning managers, instructors, higher education experts, and policymakers	Qualitative	In-depth interview	Grounded theory
2	Ohani Zonouz et al. (2022)	Designing Quality Evaluation Model in the Electronic Curriculum in Higher Education	20	Specialists, professors, and experts active in E-learning in higher education in the country	Qualitative	Semi-structured interview	Thematic analysis
3	Niyazi et al. (2021)	Factors affecting the quality of E-learning in Farhangian University of Khuzestan Province: Based on Grounded theory approach	15	Managers, officials, experts, thinkers, and prominent university faculty members	Mixed method	Deep unstructured interview	Grounded theory
4	Barari et al. (2019)	Evaluating the Goals of High Levels of Learning in E-learning Environments	12	Experts and teachers of electronic centers of the education departments	Qualitative	Semi-structured interview	Creswell Coding Pattern
5	Ahangari et al. (2019)	Identifying the Components of Evaluating the Internal Effectiveness for Academic E-courses:	25	Content specialists, producers, and training designers	qualitative	interview	Content analysis

		Qualitative Study				
6	Pourkarimi & Alimardani (2021)	Phenomenological Analysis of the Factors Affecting Interactions in the E-learning Environment	40	students of electronic courses at the University of Tehran	qualitative	Deep, semi-structured interview	Content Analysis
7	Zareisaroukolaei et al. (2020)	Determinants of E-learning effectiveness: A qualitative study on the instructor	12	Instructors of E-learning courses in universities in Tehran	qualitative	Semi-structured interview	Qualitative content analysis
8	Roodsaz et al. (2017)	Identifying causal factors affecting the university virtual learning pattern in Iran	24	Experts in the subject area.	qualitative	In-depth interview	Grounded theory
9	Ebrahimi et al. (2021)	Identification and Explanation of the Requirements of E-teaching/learning, Proportionate to Characteristics of Today's BA Level Students	31	experts in the two fields of educational sciences and social sciences	Mixed method	Semi-structured interview	Thematic analysis
10	Poortavakoli et al. (2020)	Designing a pattern for e-content development based on the factors affecting satisfaction in E-learning	30	Experts working in the field of E-learning all over the country.	Mixed method	Unstructured interview	Grounded theory
11	Shahmohammadi et al. (2019)	Designing and Validating of Evaluation Model in Distance Education System	15	professors and researchers	Mixed method	Interview	Grounded theory
12	Taghaddomi & Mazandarani (2023)	The best practice in developing asynchronous online educational Materials: the attitudes of educational materials experts in developing university textbooks for the students of the humanities.	12	educational materials experts	qualitative	Semi-structured interview	Thematic analysis

Data Analysis, Synthesis, and Interpretation

To make sense of the data, we adopted Major & Savin-Baden's (2010) three-phase model, beginning with analysis, continuing with synthesis, and concluding with interpretation. In the initial phase, the results of all the articles in the database were thoroughly examined for possible themes that might have been relevant to the question of this study. The abstracted themes from the individual studies were then compared and contrasted with their counterparts across the other studies to arrive at a full list of "first-order themes" that could provide the needed information to answer the research question (Major & Savin-Baden, 2010). In the second phase, it was attempted to delve into the thick descriptions reported in the database and combine the already abstracted first-order themes at a higher level, coming up with a list

of what Major & Savin-Baden (2010) call "second-order themes." Finally, the interpretive stage categorized the identified themes from phases I and II under broader themes (Major & Savin-Baden's proposed "third-order themes"). This could help us bring further sense and order to the findings.
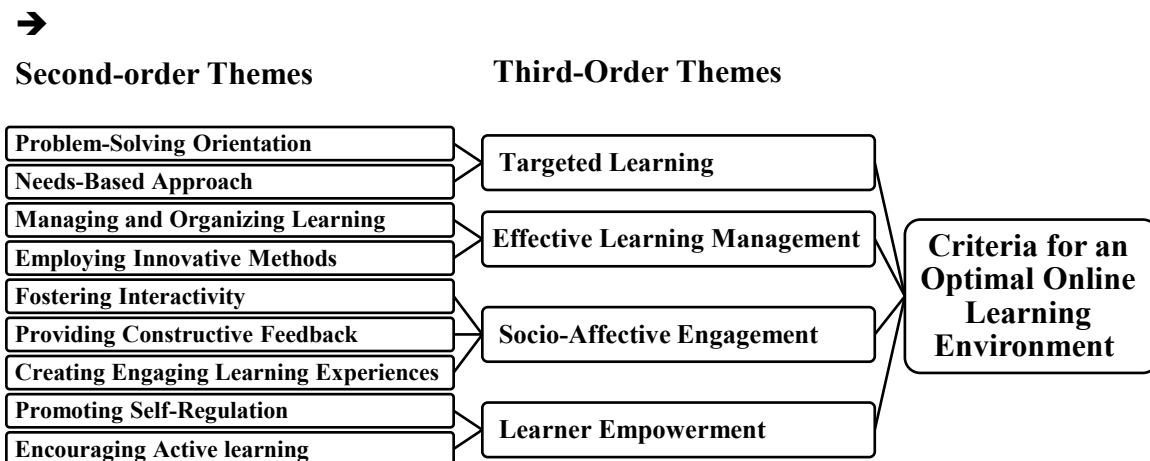
To ensure trustworthiness and transparency, we provided a thorough account of the administration and interpretation processes. Moreover, both researchers actively participated in all stages of the study, encompassing primary data coding to abstracting second-order and third-order themes. Initially, they conducted these tasks individually, followed by collaborative discussions to address potential discrepancies in their findings.

Results

The second-order and third-order themes abstracted from the first-order themes identified in the dataset are presented in Figure 1. On the whole, four overarching themes, namely targeted learning, effective learning management, socio-affective engagement, and learner empowerment, seem to have accounted for the whole dataset, indicating an overall proposal as to the criteria for an optimal online learning environment in the Iranian academic context. Each of these third-order themes will be presented thoroughly in the following paragraphs.

Figure1

The Second-order and Third-order Themes Abstracted from the First-Order Themes

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Second-order Themes   **Third-Order Themes**

| Problem-Solving Orientation |
| Needs-Based Approach |

→ **Targeted Learning**

| Managing and Organizing Learning |
| Employing Innovative Methods |

→ **Effective Learning Management**

| Fostering Interactivity |
| Providing Constructive Feedback |
| Creating Engaging Learning Experiences |

→ **Socio-Affective Engagement**

| Promoting Self-Regulation |
| Encouraging Active learning |

→ **Learner Empowerment**

Criteria for an Optimal Online Learning Environment

Third-Order Theme 1. Targeted Learning

Figure 1 shows the first third-order theme resulted from two second-order themes, namely problem-solving orientation and needs-based approach, each of which corresponded to several first-order themes in the database. Firstly, problem-solving orientation was proposed

to cover a range of first-order themes abstracted from the 12 studies in the database; these themes were problem-oriented teaching (1,3,8, & 10), bearing optimal resemblance to real-life situations (1,3), employing task-oriented teaching (12), assessing transferrable concepts rather than memorized items (4), linking evaluation to the realities outside the classroom (4), and employing task-oriented evaluation (4 & 6).

A considerable number of the analyzed studies highlighted the importance of gearing the teaching materials and activities to the kind of real-life problems. For instance, one of the experts who was interviewed in study #12 held that such endeavors could "lead to [maximized] learning and keep the student focused on the content being taught. This can improve both attraction and learning." Meanwhile, it was underscored that the same approach must be adopted towards assessment, as well; one way or another, the studies pinpointed that assessment can play a facilitative role in transferring the content learned in the classroom to the outside world. In this regard, one of the participants of study #4 advocated the smart use of exams and warned that "while designing tests, the designer should not use the exact sentences and [items] mentioned in the class. If they ask questions about such things, [they] assess memorized knowledge." Elsewhere in the same study, another participant asserted that "I always take photos of the phenomena and incidents occurring on- and off-campus…. And use them in the evaluation questions. This way, the learners will get [more familiar with] the application of what they have learned."

Furthermore, the identification of eight first-order themes in the original studies led to the development of the other second-order theme introduced as the needs-based approach. These themes were gearing teaching to the learners' level and background knowledge (1 & 5), needs-driven and learner-oriented teaching (1 & 12), taking individual differences into account (1, 2, 10, & 12), gearing teaching to the learners' needs (1 & 9), exercising flexibility and adjustability to cater for diverse needs (1, 2, 8, 10, & 11), paying attention to the learners' felt needs (3, 5, & 12), being sensitive to the cultural context and the learners' cultural background (3, 5, 10, & 12), & employing diagnostic evaluation (2).

Along with the problem-solving orientation, the needs-based approach was identified as one of the key characteristics of an optimal online course. There was a significant consensus over the necessity of taking the diverse needs, learning styles, educational and cultural backgrounds, and personal tendencies of the students into consideration. Concerning the match between the level of the content and that of the students, one of the interviewees in study #5 maintained:

- The content should not exceed the level of understanding of the one who is going to read it. It should be aligned with the previous knowledge of the one who wishes to obtain that [topic] or the class or group that wishes to be educated.

In the same vain, an interviewee from study #9 emphasized the opportunity that has risen in the online space due to the advances in technology and stated that "nowadays, through the online space, it is possible to cater for a wide spectrum of learners' needs, skills, and tendencies."

Finally, it was pointed out by some that along with the personal needs and individual differences of the learners, the cultural particularities of the immediate context in which teaching takes place must be taken into consideration. In this regard, a participant in study #5 asserted that as well as taking advantage of the international experience, educators should "have an eye on our own nation and culture, our conventional and cultural issues and [beliefs]."

Third-Order Theme 2. Effective learning management

As presented in Figure 1, two second-order themes, namely managing and organizing learning and employing innovative methods, are subsumed under the higher-order theme of effective learning management. The former second-order theme is made up of eight first-order themes such as striking a balance between content and teaching time (6), ensuring logical and appropriate organization (10 & 11), offering clear and operational definition of the objectives and plans of the lessons (3, 5, 6, 8,11, & 12), establishing a link between the advance organizers and the content, employing formative (progressive) evaluation (1, 2, & 8), employing final evaluation (2 & 8), employing initial evaluation (2), and employing goal-directed evaluation (3 & 5).

Overall, this second-order theme signifies the importance of a proportionate and sequenced treatment of all stages of learning, from the provision of a clear delineation of the goals and objectives of the lesson and a smooth movement between the phases of teaching to conducting appropriate evaluation at different phases and for different purposes. Firstly, one student interviewed in study #6 drew attention to the importance of time management and warned the instructors not to overwhelm the learners by introducing too many references. The student stated that:

- At the beginning of each semester, some professors introduce tons of references to be covered …. At the end of the same semester, we would discover that they were not included in the exam and that obtaining them was not necessary.

Along the same line, an education expert from study #5 emphasized the vital role the sharing of clear goals and objectives can play in the successful implementation of electronic courses and maintained that "in the first place, I relate the effectiveness of E-learning to its goals. The goals must be clear, exact, and broken down [into objectives] to the extent that the functional goals are quite [communicated]."

Finally, in a considerable fraction of the reviewed studies, the participants cast light on the major role evaluation may play in different stages of learning. In particular, one of the educational experts interviewed in study #5 believed that evaluation could give the decision-makers the chance to realize whether the intended goals and objectives of the course are met. It could help to discover "if the audience has achieved the goals … or not."

The other second-order theme underscored the importance of employing innovative and diverse pedagogical tools and methods. It was formed based on seven first-order themes, including employing gamification (4), employing simulators (virtual laboratory, etc.) (4), employing multimedia and diverse technologies (1, 2, 3, 9, 10, 11, & 12), diversifying teaching methods (8), employing multiple and diverse tests (2, 4, 10, & 11), portfolio building (4), and employing oral evaluation (demanding the learners to give a talk) (4 & 6).

Concerning the contribution of games to educational contexts, one of the participants in study #4 stated that no matter how old he or she is, "you can observe most of the learner's characteristics via a purposeful game. During the game, the learner manifests whatever he has learned about the topic creatively." Meanwhile, more than half of the reviewed studies pointed to the crucial role of multimedia in diversifying education and maximizing learning. For instance, an expert in study #9 maintained that "for today's university students, watching and listening are preferable over reading and writing. Their easy access to multimedia with audio-visual attractions via smartphone or tablet [necessitates] taking maximum [advantage] of the role movies and animations can play in education."

Third-Order Theme 3. Socio-Affective Engagement

As shown in Figure 1, the third overarching theme abstracted from the data is Socio-affective engagement, which includes three second-order themes, namely fostering interactivity, providing constructive feedback, and creating engaging learning experiences. Fostering interactivity was achieved by the identification of eight first-order themes, namely ensuring instructor-instructor interaction (3), ensuring student-student interaction (1,3, 10, & 12), ensuring instructor-student interaction (1,3, 5, 8, 10, & 12), ensuring student-content interaction (1, 2, & 10), launching discussion forums (1, 3, 4, 8, & 12), having full-time communication channels with the learners (7), teamworkking and team project (3 & 7), and employing peer assessment (4).

Interaction between and among the learners themselves, as well as between the students and instructors, was at the heart of this theme. Most of the participants in the primary studies asserted that there should be sustained channels of communication via which the instructors and students could be in touch. This was proposed to be in the form of a forum where everybody could share and exchange ideas and comments, making the experience more like that of an on-site classroom environment. An interviewee from study #12, for instance,

commented that "if possible, there should be a forum where the professor could get online for some moments [or] some hours …The students could ask questions and receive answers." Building on his or her personal experience, a university instructor from study #7 highlighted the benefits of such a forum and maintained:

- Electronic courses are 24/7 …. At 2 or 3 AM, or whenever I am awake, I answer my students…. The electronic courses are not limited to the class [time]. They are not limited to the LMS. They can ask their questions whenever they want to. They send their questions to the group, and we answer them at other times, whenever we have the time.

Furthermore, it was believed that this kind of interaction could take the form of group work and team projects where the students could collaborate to achieve the desired goals. The spirit of collaboration was reported to facilitate the learning process. With regard to the advantages of such a practice, an interviewee from study #7 held:

- We can establish collaborative learning among people. In cooperative learning, the learners go through the whole path together …. They have to constantly interact, teach each other, and learn from each other.

This spirit of interaction and collaboration was also believed to be a contributing factor when it comes to assessment, where the learners may assess one another. In this regard, a participant interviewed in study #4 asserted that "there will be a forum where the students will be able to upload their portfolios and, during the semester, be evaluated and criticized by the observers."

The next second-order theme under socio-affective engagement revolved around constructive feedback, which in turn stemmed from five first-order themes, including providing progressive and timely feedback (1,6, 8, &10), eliciting learners' feedback regarding the lesson content (4), providing timely answers to questions (2), troubleshooting (Q & A) (6), and employing educational assessment (3 & 9).

The provision of constant and timely feedback was reported to be an effective way to consolidate and maximize learning and to play a pivotal role in the success of a given online course. From the perspective of a student, a participant from study #6 stated that "the professor always reads our ideas and questions and gives us feedback accordingly … this is very valuable and encourages us to participate." On the other hand, an interviewee from study #4 looked at this matter from the viewpoint of an instructor and maintained:

- Most of the time, at the end of an online session, I ask the learners to present their ideas about the concepts discussed in the class in the form of exit notes. This way, the learner can leave the class by writing his or her ideas about both the quality of the class and the learned material. This activity can enhance their evaluative skills.

The final second-order theme subsumed under this third-order theme was found to be geared to the engaging learning experiences in online classes, including five first-order categories such as ensuring social presence (5, 6, 7, & 12), having video sessions with the learners (6), establishing informal learning environments (7), communicating feelings and emotions (1), and taking the aesthetic principles into account (10).

This second-order theme entailed the importance of the instructor's presence so that the students can feel they are interacting with a real human being as their instructor. A range of alternatives were suggested to ensure such a kind of social and humane presence; holding video sessions or turning the camera on while teaching was reported to be an effective way. An expert interviewed in study 12, for instance, maintained that "I should put my video on the corner of the screen so that they can have both the screen and my face and facial mimics." Along the same line, a participant from study #7 spoke of his or her personal experience and delineated how he or she tried to maximize social presence in the class using a friendly and informal tone of voice. The participant stated that "the students kept saying that the calmness of your voice reduced our fatigue. [they said] we never had the same experience before."

Third-Order Theme 4. Learner Empowerment

The final third-order theme is learner empowerment, which covers two second-order themes, namely promoting self-regulation and encouraging active learning. Under the former, five first-order themes are classified, including choosing one's own instructor and educational resources (1), promoting self-management and self-regulation (3), ensuring scaffolding and facilitation (3, 8, & 10), offering guiding manuals (3 & 12), and promoting self-assessment (1, 3, & 10).

According to a number of the reviewed studies, an optimal online learning course must pave the way for enhancing autonomy and improving agency on the part of the learners to provide them with the opportunity to take control of and regulate their learning. It was believed that the learners should have a say in selecting their instructors and the materials they were more comfortable with. They should also be provided with the necessary help whenever they ask for it. In the meantime, they must be equipped with the required knowledge, confidence, and experience to conduct self-analysis. The primary step, however, to ensure such autonomy and agency was believed to be the provision of a guiding manual so that they could easily navigate their way while working with the learning management system. An expert from study #12, for example, held that:

- This system is not going to have a complicated design either. However, it is logical to prepare a short and simple tutorial video where different parts and capabilities of the system will be explained along with the way to access each. This way, a student who knows the least about such a system can use it quite easily.

The other second-order theme was encouraging active learning, which in turn encompassed five first-order themes, including promoting experiential learning (learning by doing) (5), promoting discovery learning (8), employing practical activities and projects (1, 10, & 12), keeping the learners involved and ensuring active engagement (7 & 12), and employing performance tests (4 & 6).

The underlying assumption for all of the primary themes included under this second-order theme was that active engagement with the act of learning on the part of the learners can contribute greatly to the process of learning. Learning opportunities were believed to be maximized when the learners were expected to carry out hands-on activities. Therefore, an interviewee from study #5 commented that "learning experiences are among the factors: What experiences the learner must gain to achieve the goal."

Discussion

The research focused on identifying the criteria for an optimal online educational environment for Iranian university students through a qualitative research synthesis (QRS). By conducting a comprehensive review of 12 studies, the researchers identified four overarching themes that contribute to creating positive E-learning experiences and outcomes: targeted learning, effective learning management, socio-affective engagement, and learner empowerment. These themes highlight the significance of instructional design and online learning experiences in addressing the specific needs of students in the Iranian academic context. The findings of this study add valuable insights to the E-learning research literature, especially in the context of Iran.

The first theme, targeted learning, highlights the significance of problem-solving orientation, which involves aligning teaching materials and activities to real-life situations. The reviewed studies indicate the importance of addressing learner needs and preferences in online learning environments. The idea that problem-solving orientation enhances student engagement and learning outcomes is congruent with several previous studies in E-learning and instructional design. Problem-based learning (PBL) approaches in online education foster higher-order thinking skills (Suhirman et al., 2020) and increase student engagement (Kristianto & Gandajaya, 2023). The second aspect of targeted learning, the needs-based approach, plays a crucial role in optimizing online courses by considering the diverse needs, learning styles, and cultural backgrounds of students. This approach ensures that the contents are appropriate and relevant to the student's previous knowledge, leading to more personalized and effective E-learning experiences. The emphasis on learners' needs and their impact on creating personalized experiences aligns with the principles of differentiated instruction. According to Tomlinson et al. (2003), differentiated instruction involves modifying contents, processes, and products in response to students' varied learning needs. This approach has been shown to enhance student motivation, engagement, and academic

performance. Moreover, the emphasis on catering to individual differences, such as skills and tendencies, contributes to the growing body of research on personalized learning in online education (Whalley et al., 2021). The research literature has acknowledged the benefits of tailoring educational experiences to individual learners, and the current study's focus on individualization supports this notion.

The second theme, effective learning management, underscores the importance of well-organized teaching practices and efficient E-learning tools. The reviewed studies emphasize that effective time management, clear objectives, and timely assessment help students understand what is expected of them, leading to better engagement and learning outcomes. Moreover, the studies highlight the significance of diversifying teaching methods through multimedia, gamification, simulators, and other innovative technologies to foster student interest and learning. The idea that a well-organized presentation positively impacts student engagement and learning outcomes is consistent with existing research in the field of online education. For example, a review by Kauffman (2015) found that effective time management and clear objectives in online courses positively correlated with student satisfaction. This finding is also closely related to teacher presence in the community of inquiry framework (Fiock, 2020). By adopting well-structured teaching practices, clear communication of learning objectives, and timely assessment, teachers can actively engage with their students, establish a strong presence in the virtual learning environment, and foster an environment conducive to effective learning outcomes. The use of various evaluation methods, as highlighted in the current study, aligns with research by Nicol and Macfarlane-Dick (2006), which suggests that providing timely and constructive feedback through formative assessments positively impacts student learning and academic achievement. Finally, the emphasis on diversifying teaching methods and integrating innovative technologies resonates with Mayer's (2020) cognitive theory of multimedia learning. The theory posits that presenting information through multiple modalities, such as visual and auditory channels, can enhance learning by reducing cognitive load and facilitating the construction of mental models.

The third theme, socio-affective engagement, emphasizes the significance of fostering interactive and constructive interactions among learners in the online setting. This includes promoting instructor-instructor, student-student, and instructor-student interactions to create a sense of community and collaboration among students. Constructive feedback is highlighted as a pivotal element in consolidating learning, emphasizing the importance of providing timely and progressive feedback. The studies also emphasize the affective aspect of teaching practice, such as establishing informal learning environments and considering aesthetic principles as contributing to the overall success of online teaching and learning experiences. First, the finding that fostering constructive interactions in the online learning environment enhances the learning experience is consistent with prior research in online education.

Research by Kreijns et al. (2022) identified that social presence, or the extent to which learners feel connected and involved in the online learning community, positively affects student satisfaction, engagement, and learning outcomes. Moreover, a study by Sher (2009) supports the notion that instructor-student and student-student interactions are critical components of successful online courses. Second, the emphasis on constructive feedback aligns with research on feedback in online education (Johnson & Priest, 2014). For example, the meta-analytic research by Van der Kleij et al. (2015) shows that elaborated feedback can have a positive impact on students' learning outcomes in computer-based learning environments. Therefore, providing students with meaningful feedback enables them to monitor their progress, identify areas for improvement, and actively engage in the learning process. Finally, the focus on the affective aspects of teaching practice and creating informal online learning environments aligns with the open communication and affective expression elements in the concept of social presence (Wang et al. 2022). Also, the emphasis on establishing informal learning environments and considering aesthetic principles aligns with Um et al.'s (2011) research on emotional design, indicating that positive emotional design reduced the perceived difficulty of the learning task, leading to increased motivation and satisfaction. By creating aesthetically pleasing and emotionally engaging learning materials, instructors can create a positive online learning experience that enhances students' motivation and fosters a conducive learning environment.

The fourth theme, learner empowerment, underscores the significance of allowing students to select instructors and learning materials. Additionally, the studies highlight the importance of providing necessary support for learners to conduct self-assessment, fostering self-regulation. Active learning practices, such as experiential learning, discovery learning, and practical activities, are also emphasized. Leveraging learner agency is considered one of the pillars of online pedagogy (Archambault et al. 2022). Zimmerman and Schunk (2011) have explored self-regulated learning and its role in fostering students' metacognitive skills, motivation, and academic success in various learning environments. The importance of self-regulation in E-learning environments has also been demonstrated (Broadbent & Poon, 2015). This body of literature shows that success in online learning requires the ability to become more autonomous and monitor one's learning. The emphasis on active learning practices in the reviewed studies aligns with research on the effectiveness of active learning in online education. Studies by Gahl et al. (2021) and Lamon (2020) have found that active learning strategies, such as experiential and discovery learning, enhance student engagement, critical thinking, and satisfaction. Overall, the findings related to learner empowerment underscore the importance of creating an educational environment that empowers students to take ownership of their learning journey. Educators and instructional designers can utilize these insights to design more student-centered and engaging online courses, ultimately enhancing students' learning experiences and outcomes.

Conclusion

This research contributes significantly to the literature on E-learning in the Iranian academic context by identifying the criteria for an optimal online learning environment through qualitative research synthesis. The four overarching themes of targeted learning, effective learning management, socio-affective engagement, and learner empowerment provide valuable guidance for instructional designers, educators, and policymakers seeking to enhance the quality of online education.

This study offers theoretical and practical implications to the field; on the theoretical level, it puts forward a comprehensive model for optimal online learning environments abstracted from the existing body of literature. Furthermore, on the practical level, it contributes to the growing body of knowledge on E-learning and lays the groundwork for the development of culturally relevant and high-quality online educational environments for Iranian university students. By focusing on targeted learning, effective learning management, socio-affective engagement, and learner empowerment, educators and policymakers can create positive and transformative E-learning experiences that enhance learning outcomes, satisfaction, and the effective adoption of online education among universities.

However, the methodological weaknesses in some of the reviewed studies may have impacted the credibility of the drawn conclusions. Future studies should strive to address the same issue, adopting research methodologies other than the one employed by this study to strengthen the evidence base for creating effective online educational environments in the Iranian context.

Finally, despite the valuable insights gained through the present study, further studies are suggested to be carried out to provide the field with more solid evidence regarding the query of concern. The research database in this study was limited to the Iranian context, which might have limited the generalizability of the findings to a broader population. Researchers from other contexts are suggested to employ the same mythology to provide a more comprehensive understanding of the criteria for an optimal online learning environment tailored to given cultural settings.

Conflict of interest

The authors declare no potential conflict of interest regarding the publication of this work. In addition, the ethical issues including plagiarism, informed consent, misconduct, data fabrication and, or falsification, double publication and, or submission, and redundancy have been completely witnessed by the authors.

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