



E-Learning Barriers and Opportunities in Higher Education in Saudi Arabian Universities: A Literature Review

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Abstract

E-learning has revolutionized higher education worldwide by providing unprecedented flexibility and improved access; However, its effective application remains hindered by multifaceted challenges, particularly within the context of Saudi Arabian universities. This study aimed to identify the primary obstacles to digital adoption while evaluating the role of faculty perspectives and theoretical frameworks in navigating these complexities. Utilizing a bibliographic review method, the study identified and synthesized relevant journal articles, reports, and reviews to provide a comprehensive overview of current knowledge and research gaps. The results classify these barriers into institutional, cultural, pedagogical, and technical categories, highlighting that effective implementation is contingent upon addressing issues such as lack of training, resistance to transformation, and insufficient technical infrastructure. In conclusion, the success of e-learning depends on a holistic synergy between robust infrastructure and faculty self-efficacy, as the application of theoretical frameworks enables universities to better understand and alleviate adoption pressures. By fostering a supportive and culturally sensitive environment, institutions can empower both teachers and students, ultimately promoting a more flexible and accessible learning experience.

Keywords: E-learning, remote learning challenges, e-learning barriers, higher education, Saudi Arabia, e-learning implementation

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Introduction

Instructional curricula in the contemporary academic era have been rendered increasingly accessible to geographically dispersed students through the strategic implementation of electronic learning, commonly known as e-learning. This sophisticated online education framework integrates

various multimedia technologies within structured pedagogical settings, allowing for a flexible delivery of knowledge that can be accessed both synchronously and asynchronously through specialized electronic hardware and software. Characteristically, e-learning is facilitated via personal computing devices, which serve as the primary interface between the learner and the digital curriculum (Suzianti & Paramadini, 2021). Consequently, teaching methodologies at the university level have undergone a profound transformation in recent years, with nearly all advanced higher education organizations now offering a diverse array of courses and instructional activities through robust e-learning systems to meet the demands of a digitized society (Goller et al., 2023).

Despite the rapid proliferation and technical advancement of these digital platforms, the global academic community has observed concerning trends, specifically characterized by high dropout rates and suboptimal achievement levels within these virtual education settings (Contreras-Villalobos et al., 2023). These challenges are typically attributed to a significant decline in student inspiration and psychological involvement, which is critical for sustained academic success in environments that lack physical proximity. Furthermore, the global landscape of higher education was drastically reshaped by the COVID-19 pandemic, an unprecedented crisis that forced advanced teaching institutions to execute an abrupt transition from traditional, face-to-face instruction to online modalities as a primary strategy to ensure academic continuity (Haleem et al., 2022).

Over time, however, these forced digital transitions have revealed several systemic complications that go beyond simple technical issues. On one hand, a notable decrease in student motivation has led to a palpable loss of participation and active engagement within the virtual classroom environment. Simultaneously, educators face increasingly complex difficulties in maintaining student attention across digital interfaces, a hurdle that ultimately threatens the long-term sustainability and effectiveness of online education systems (Jamilah & Fahyuni, 2022).

While the general barriers to digital education are well-documented on a global scale, there remains a critical necessity to investigate the nuances and intersection of institutional readiness and faculty perceptions within the specific socio-technical landscape of Saudi Arabia a context where rapid digital transformation meets unique cultural and academic traditions. Accordingly, the primary purpose of this research is to comprehensively evaluate the diverse barriers hindering effective e-learning implementation in higher education institutions across Saudi Arabia. By synthesizing faculty perspectives on the inherent advantages and disadvantages of e-learning, this study seeks to offer a balanced scholarly discourse that informs future policy refinement and pedagogical strategies in the Saudi Arabian academic environment.

Methodology

The methodology of this study is meticulously designed to provide a transparent and rigorous framework for synthesizing existing scholarship regarding the digital educational shift. By adopting a qualitative narrative review approach, this section delineates the systematic procedures employed to identify, screen, and analyze relevant literature, ensuring that the findings are grounded in high-quality, peer-reviewed evidence. The following subsections detail the academic repositories utilized, the strategic keyword optimization, and the thematic synthesis protocols that underpin the integrity of this bibliographical assessment.

Research design and academic data sources

This bibliographical assessment was meticulously conducted through a comprehensive and critical examination of scholarly literature hosted across the world's leading academic databases, including Google Scholar, Web of Science, ScienceDirect, ResearchGate, and Scopus. The deliberate selection of these diverse and high-impact repositories ensured a global reach and facilitated access to a wide spectrum of multidisciplinary research, thereby providing a robust and multifaceted foundation for analyzing the complex digital shifts currently occurring within the higher education

sector.

Search strategy and keyword optimization

To ensure a holistic and nuanced understanding of the evolving digital pedagogical landscape, the search strategy employed a sophisticated combination of high-impact keywords and controlled vocabulary, specifically: "e-learning," "faculty challenges," "higher education," "technology integration," "TPACK," "SAMR," and "virtual learning barriers." These terms were strategically selected not only to capture the immediate practical hurdles and systemic obstacles faced by educators in virtual environments but also to incorporate the foundational theoretical frameworks—such as the Technological Pedagogical Content Knowledge (TPACK) and the Substitution, Augmentation, Modification, and Redefinition (SAMR) models—that serve as essential benchmarks for measuring the success and maturity of digital instructional transitions.

Inclusion criteria and quality appraisal protocols

The overarching selection process was governed by rigorous quality parameters and strict inclusion criteria, wherein only trustworthy, peer-reviewed academic articles were encompassed to maintain the scholarly integrity and empirical weight of this review. By prioritizing high-quality, peer-reviewed sources over gray literature or non-academic commentaries, the study ensured that the synthesized data met the most stringent established academic standards for validity, reliability, and methodological soundness, which is crucial for a high-level conceptual assessment.

Screening process and thematic synthesis

Following the initial retrieval of a vast document pool, a multi-stage screening process was rigorously implemented to refine the relevance of the data; Subsequently, duplicates, non-academic opinion pieces, and materials deemed irrelevant to the specific focus on higher education were regularly removed to ensure a clean and focused dataset. The final assortment of studies underwent a detailed thematic synthesis, meticulously organized to distill and highlight the most significant recurring themes and critical matters associated with faculty members' experiences in e-learning applications. By synthesizing these diverse and sometimes conflicting scholarly perspectives, this methodology facilitates a deeply nuanced exploration of the systemic barriers and strategic opportunities that are naturally woven into the digital transformation of the global and Saudi Arabian academic landscapes.

Result and Discussion

The evolution of knowledge acquisition

E-learning has the potential to fundamentally change the mechanisms through which knowledge is shared and acquired. It serves to increase educational value and enhance student involvement; however, while it cannot fully substitute for the direct role of lecturers or instructors, it significantly augments current pedagogical methods and optimizes time management (Abidin, et al., 2023; Ayu, 2020). For online learning to be successful, its core information and services must maintain parity with conventional learning standards. This mode of education is essentially transformative, as it empowers students to engage with material at any time, from any global location, and at their own desired pace

Despite its growing significance in higher education, there remains a lack of comprehensive data regarding the gratification needs of diverse student age groups enrolled in online courses (Yawson & Yamoah, 2021). Consequently, this bibliographic review synthesizes previously published studies to provide a holistic overview of current knowledge, key issues, and research gaps. In developing nations, there is a distinct requirement to strengthen organized structural elements to bolster e-learning motivation (Ivanović et al., 2018). While blended education is highly valued for meeting student needs for mobility, its implementation remains a complex and problematic procedure

(Bruggeman et al., 2021). Global trends indicate that academic staff increasingly view knowledge analytics as a primary method for understanding educational activities and dynamically adjusting syllabi to suit student requirements (Kollom et al., 2021).

The impact of the COVID-19 pandemic

The COVID-19 pandemic acted as a global catalyst, enabling an immediate shift toward e-learning in higher education. This crisis demanded that teachers adjust their pedagogical approaches within an extremely short time frame, regardless of their prior level of preparedness or equipment (Scherer et al., 2021). Currently, education is undergoing a permanent transition from conventional methods to digital platforms (Madheswari & Mageswari, 2020). Furthermore, the application of sustainability and sustainable growth concepts is being significantly influenced by these advanced teaching shifts (Tasdemir & Gazo, 2020).

E-learning in Saudi Arabia

In modern pedagogical settings, technology is no longer optional but crucial. The e-learning sector in Saudi Arabia is currently one of the most rapidly expanding markets worldwide. To effectively engage learners, instructors must utilize a variety of technological systems. However, a generational gap persists; some instructors educated through orthodox methods find it challenging to integrate technology into their teaching. Research confirms that social enablement and the creation of viable employment in Saudi Arabia are inextricably linked to education, training, and e-learning. This synergy explains why digital education consistently assists in the long-term creation of sustainable jobs and societal empowerment, aligning with the Saudi Vision 2030 framework. National educational strategies act as a mediator between societal enablement and the conception of viable engagement. Furthermore, from a constructivist perspective, e-learning facilitates the development of a capable human resource pool by allowing training without disrupting existing work requirements. Nevertheless, these outcomes are meaningfully moderated by Saudi Arabian national policies, which ensure that national values support sustained financial growth (Singh et al., 2022).

Focus on faculty perspectives

Faculty engagement is central to the success of digital platforms. Research indicates that the utilization of Blackboard is shaped by both external regulatory factors and internal motivators. One study reported an 84% positive attitude toward e-learning among faculty, with a mean score of 3.10 $\pm$ 0.22, showing a significant association between instructor perspectives and available technological support (Akbarilakeh et al., 2019). Instructors generally argue that the Blackboard method is more beneficial and user-friendly, confirming a strong sense of self-efficacy. Despite high levels of interest, faculty members emphasize that to overcome the challenges they face, further institutional support and specialized training are required.

Theoretical frameworks and models in E-learning

Theoretical frameworks are essential for evaluating the challenges and success factors of e-learning integration. Instructors must adapt to various models such as the SAMR and TPACK frameworks to improve student performance (Nair & Chuan, 2021). The following diagram illustrates the key theoretical frameworks and models that facilitate e-learning adoption (Figure 1):

1. Behaviorism: Emphasizes understanding skills through systematic methods. Faculty members must provide consistent feedback based on student responses to repeated stimuli (Burhanuddin et al., 2021).
2. Cognitivism: Focuses on internal interests and the brain's response to information. It prioritizes the logical structuring of course content over simple memorization (Mahbub & Beedle, 2025).
3. Constructivism: A dynamic approach where knowledge is reflected through personal

experience. It encourages students to apply their prior experiences to solve problems in new digital environments (O'Connor, 2022).

4. TPACK model: This model identifies three critical knowledge intersections: Technological (TK), Pedagogical (PK), and Content Knowledge (CK). Integration of these components is essential for professional growth and effective practice (Elmaadaway & Abouelenein, 2023).
5. SAMR model: Developed by Ruben Puentedura, this model guides the sequential progress of technology use, from simple substitution to the transformational redefinition of educational tasks (Cáceres-Nakiche et al., 2024).

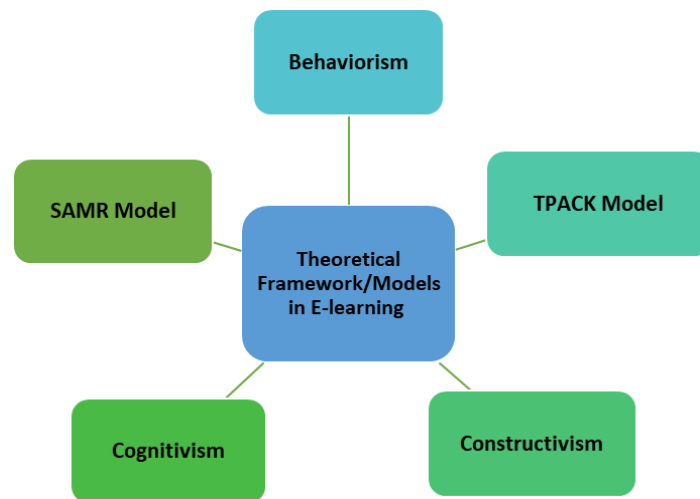


Figure 1. Key theoretical frameworks and models for E-learning adoption.

Barriers to E-learning implementation

Successful implementation depends on addressing various challenges, which can be categorized using the TIPEC (Technology, individual, pedagogy, and enabling conditions) framework (Heurteloup & Moustaghfir, 2020). The major obstacles encountered by faculty and institutions are categorized in the figure below (Figure 2):

1. Technological and organizational barriers
Insufficient infrastructure, internet connectivity issues, security threats, and inadequate technical support are primary technological obstacles (Almaiah et al., 2020). Organizational limitations such as poor policies, a lack of funding, and insufficient training—further hinder progress. In Saudi Arabia, resistance to change and system breakdowns are notable hurdles (Al Mulhem, 2020).
2. Individual-level challenges
Lack of ICT Skills: Navigating complex digital platforms remains a major difficulty for many faculty members (Hermanto & Srimulyani, 2021).
3. Motivation and confidence: Technology can be intimidating for those lacking role models or adequate facilities (Martin et al., 2020).
4. Attitudes and beliefs: Positive beliefs toward technology significantly predict successful adoption, while prior experience remains a differentiating factor.
5. Workload and time: The heavy workload and time required to develop digital materials often reduces the capacity for effective adoption (Qazi et al., 2024).
6. Tracking progress: Monitoring a large number of students is more complex in a virtual environment compared to face-to-face questioning (Qashou, 2022).



Figure 2. Major challenges in E-learning implementation.

Pedagogical and cultural barriers

Pedagogically, e-learning should supplement rather than replace traditional methods. However, many instructors struggle to adapt their strategies for virtual settings, leading to a failure in meeting student needs (Ananga, 2020). Culturally, in Saudi Arabia, e-learning still faces resistance; 48.1% of educators in one study were reluctant to utilize it, and 28.2% noted social resistance toward online medical education (Algahtani et al., 2020). Privacy concerns, digital inequality in rural areas, and the reconfiguration of social spheres are critical factors that must be addressed to align with Saudi cultural standards (Alshwiah, 2021).

Cultural and social barriers

In Saudi Arabia, e-learning is still in its early stages. Despite the government's support, a study showed that 48.1% of educators were reluctant to use it, and 28.2% felt that society did not fully recognize online medical education (Algahtani et al., 2020). Furthermore, students in remote or rural settings face significant digital inequality compared to those in urban areas (Alshwiah et al., 2021). Saudi cultural values, including privacy concerns and the reconfiguration of social spheres, must be integrated into future digital education scenarios to ensure equity and social acceptance (Aladsani et al., 2022).

Conclusion

The application of e-learning in higher education faces numerous substantial barriers, ranging from technical restrictions to complex social and organizational issues. Notwithstanding these difficulties, e-learning offers a unique prospect for educational progression and the democratization of information. This study identifies the multifaceted obstacles hindering digital adoption while evaluating the role of faculty perspectives and theoretical frameworks in navigating these challenges. Results indicate that addressing a lack of training, resistance to transformation, and insufficient technical organization is critical for effective implementation. Furthermore, the findings reveal that heavy workloads and the time required to develop e-courses often overwhelm faculty, especially when traditional face-to-face techniques are lost in translation to the virtual classroom. In conclusion, the success of e-learning depends on a holistic synergy between robust infrastructure and faculty self-efficacy, as the application of theoretical frameworks enables universities to better understand and mitigate these pressures. The implications of this research suggest that faculty must be trained in

lesson plan designs that highlight the differences between traditional and virtual settings, while institutional policies must remain culturally sensitive. Despite these insights, the research is limited by its reliance on existing literature, which may not capture real-time technological shifts. Consequently, future research should emphasize longitudinal studies and the integration of emerging technologies such as Artificial Intelligence to foster a more flexible, accessible, and supportive learning environment for both faculty and students.

Conflicts of Interest

The authors declare no conflict of interest.

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Author contribution

Alotaibi Sultan Mutasim: conceptualization, methodology, software, data curation, writing-original draft preparation, visualization, investigation, supervision, software; validation, writing-reviewing and editing.

Declaration of generative AI in scientific writing

The author declare that no generative AI or AI-assisted technologies were used in the writing or editing of this manuscript.

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