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Medical and Health Students' Acceptance and Perceptions of E-learning during the COVID-19 Lockdowns in the Kingdom of Saudi Arabia

Technology Acceptance Model

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ABSTRACT

Many educational institutions around the globe utilise E-Learning, which can provide multiple benefits for learners and teachers. Students have no geographical boundaries to prevent them from learning and receiving many other benefits based on their situation and needs. In this study, we aim to investigate the acceptance and perceptions of e-learning among medical and health students in Saudi Arabia during the COVID-19 lockdown. 99% of the respondents own technologies to access e-learning. We examined the students' learning types of preferences, and our analysis shows that around 45% preferred e-learning, 32% blended learning, and 23% chose traditional education. 29.3% disagreed, and 22% strongly disagreed that e-learning was easy to use. 32.6% agreed that e-learning was fixable, while 19.5% disagreed. We found that 16% disagreed that e-learning increases the efficiency and effectiveness of their learning, whereas 40% agreed. The researchers assessed respondents' preference for learning methods, and we reported that blended learning was preferable to traditional and e-learning. The current paper confirms the validity of the TAM model in measuring e-learning acceptance and use. We found that Medical and health students have a high favour of using e-learning. However, some issues exist in terms of its easiness.

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Introduction

Integration of technology into educational settings has experienced exponential global expansion. E-learning (electronic learning) has been extensively examined and defined, taking various forms with one aim: providing access to online learning resources to enrich educational experiences [1-2]. E-learning can serve independently and alongside traditional face-to-face learning methodologies [3]. Technological advancements continue to shape the educational landscape, leading universities and institutions to offer E-learning courses as demand for higher education increases [4]. Over the last decade, rapid developments in ICT have spurred global retraining and education efforts. Organisations across various sectors have increasingly turned to technology-driven approaches for providing services and products, moving away from traditional methods [5]. This shift has led researchers to highlight the immense value that E-learning could provide to busy lives through accessibility, convenience, and time efficiency [6].

However, despite its widespread acceptance and use, an essential aspect of E-learning has received scant scholarly consideration: assessment of medical and health students' perceptions and experiences regarding E-learning. This gap becomes especially obvious in Saudi Arabia, and this proposed study seeks to fill it by exploring medical and health students' acceptance and experiences with E-learning in Saudi Arabia; inspired by COVID-19 pandemic developments which have forced traditional learning techniques into being replaced with E-learning approaches.

Although E-learning's effectiveness has been explored extensively across numerous contexts, its effects on medical and health students still need to be explored. Their needs, demands, and challenges may influence their perceptions and acceptance of E-learning; this study seeks to address this gap by exploring their viewpoints. Despite the widespread adoption of E-learning, research on Saudi Arabia is sparse. Cultural, social, and educational nuances unique to this region may affect student attitudes and experiences related to E-learning. This research seeks to fill that void by focusing on Saudi Arabian medical and health students as participants in its research study.

By uncovering medical and health students' perceptions and experiences with E-learning, this research can provide educational institutions and policymakers with valuable insight to assist with curriculum design, technological investments and pedagogical approaches that maximise E-learning efficacy.

Understanding the factors that drive E-learning acceptance can lead to more tailored and compelling learning experiences for medical and health students. Educators can design E-learning environments that resonate with medical and health students' learning journey by identifying barriers and facilitators to adoption. The COVID-19 pandemic highlighted the

necessity of adaptable educational models. The insights gained from this study can provide educational institutions with strategies for smoothly switching between traditional and E-learning formats, providing continuity during unforeseen disruptions.

A. Research Questions

This proposed study will attempt to answer two main research questions regarding E-learning for Medical and Health Students:

1. What are Medical and Health Students' perceptions of E-learning's usefulness?
2. What are Medical and Health Students' perceptions of E-learning's ease of use?

The study will investigate these questions using the Technology Acceptance Model (TAM). TAM provides an effective means of gauging users' acceptance of technology based on perceived usefulness and ease of use.

Literature Review

Medical students preferred e-learning over traditional lectures due to its availability, video quality, repeatability, and practicability [7]. Also, an e-learning intervention can improve health, well-being, and instruction quality in medical education [8]. E-learning in healthcare, especially in developing countries, has been proven valuable in multiple studies, including [9], [10]. The literature demonstrated many benefits of e-learning; for instance, A survey by Oye and colleagues concluded that e-learning is more student-centred than face-to-face learning, which relies primarily on the teacher [11]. Naved et al. argued that e-learning offers flexibility, low costs, and the ability to study from home instead of face-to-face learning [12]. Even though e-learning still has shortcomings, including inequities in technology access, computer skills learning, and a lack of physical space for teaching and learning [13]. Learners' perceptions and attitudes need by assessed and examined to determine the e-learning effectiveness. A student's level of satisfaction is one of the most important indicators of the quality of education [14]. A study by Michael Tagoe revealed that students prefer blended courses, which combine face-to-face and online activities [15].

Recent research shows that students are dissatisfied with e-learning during the COVID-19 era [5]. A large percentage of students have assimilated more information through face-to-face learning than through e-learning, according to Alsaaty et al. [16]. Studies have indicated that students prefer face-to-face instruction over e-learning[17]. Compared to face-to-face learners, those who enrol in online platforms develop highly negative emotions such as fear, anger, and helplessness [18]. Furthermore, some studies indicate that students prefer e-learning, especially introverts, who may feel shy and lack confidence, as well as those who have

learning challenges, are uncomfortable speaking in public, and are unwilling to talk in public [19].

Technology acceptance has been the subject of several theories. They are using the technology acceptance model (TAM) as a basis for this study. Davis proposed the TAM to address the issue of why users accept or reject information technology [20]. The purpose of TAM is to provide a means by which external variables can be traced back to internal beliefs, attitudes, and intentions. Based on this study, the two most important factors in explaining system use are perceived ease of use (PEOU) and perceived usefulness (PU) (Figure 1[20]).

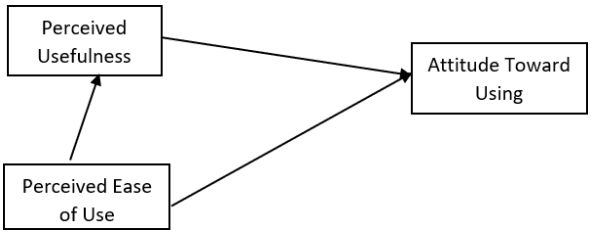


Fig. 1. TAM Model by Davis

Methods

A. Study Area and Subjects

The survey was distributed to 360 respondents, and 18 participants still needed to complete the survey. An incomplete survey resulted in exclusion from the study. Three hundred forty-two respondents were included in the survey. A total of 55% were female students, and 45% were male students, according to Pie char[1], and the respondents were aged 19 to 26. As seen from the pie chart below, the highest percentage of the respondents was for Western Saudi Arabia, while the least from Eastern Saudi Arabia, 29% and 7%, respectively. Furthermore, 28% were from the centre of Saudi Arabia.

B. Study Area and Subjects

In the present study, a cross-sectional approach was used. The survey was disseminated electronically to 360 medical and health students studying at different universities in Saudi Arabia. The respondents were informed of the purpose of the study and voluntarily participated. To collect demographic information, such as gender and age, the researchers targeted the required participants. In this questionnaire, 16 items were divided into three sections; questions (1-2) addressed the participant's demographic information, whereas items (3-4) evaluated the respondent's preferences for technology availability (e-learning, traditional learning, blended learning). There are a series of questions relating to the perceived usefulness of e-learning from (5-8) and the perceived ease of use of e-learning from (8-17).

C. Study Design

The data collection method for this study relies on distributed questionnaires, and it is a cross-sectional descriptive-analytic study. Some of the questionnaire items are based on previous surveys by Alhur [21]–[26]. The study examined the factors (perceived usefulness and ease of use) affecting medical and health students' acceptance of e-learning.

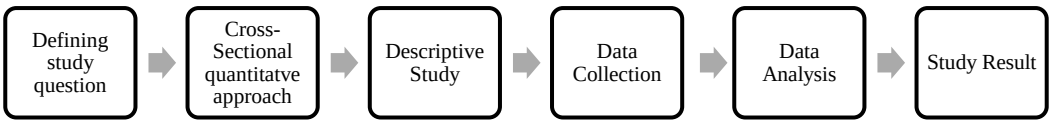


Fig. 2. Research Study Approach

D. Statistical Analysis

The data was analysed using SPSS version 17. The questionnaire was reverse-coded for all negative items. A descriptive statistics approach was used to calculate all sample attributes and questionnaire items. Our study examined the relationship between the usefulness and ease of use of the tool using Pearson's correlation coefficient.

Results and Discussion

The survey had distributed to 360 respondents, and 18 participants still needed to complete the survey. An incomplete survey resulted in exclusion from the study. Three hundred forty-two respondents were included in the survey. A total of 55% were female students, and 45% were male students, according to Pie char[1], and the respondents were aged 19 to 26.

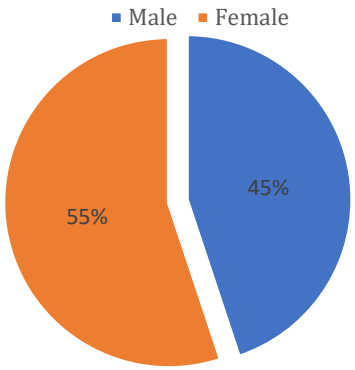


Fig. 3. Gender Distribution

As seen from the pie chart below, the highest percentage of the respondents was for Western Saudi Arabia, while the least from Eastern Saudi Arabia, 29% and 7%, respectively. Furthermore, 28% were from the centre of Saudi Arabia.

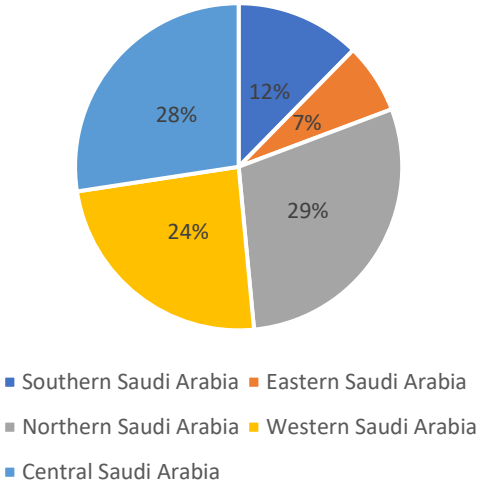


Fig. 4. Geographical Locations of the Respondents

Study participants revealed that almost all of them own Smartphones and Pcs, but only 1% claimed otherwise (see the graph below). The previous findings are precisely the same as a recent study conducted by Alhur [27], [28].

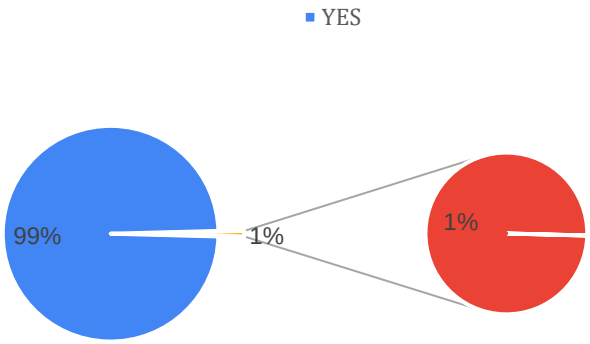


Fig. 5. Smartphone and PC Availability

The analysis demonstrated that e-learning was the most preferred type of learning (43%) among the participants, followed by blended learning (33%) and traditional learning (23%).

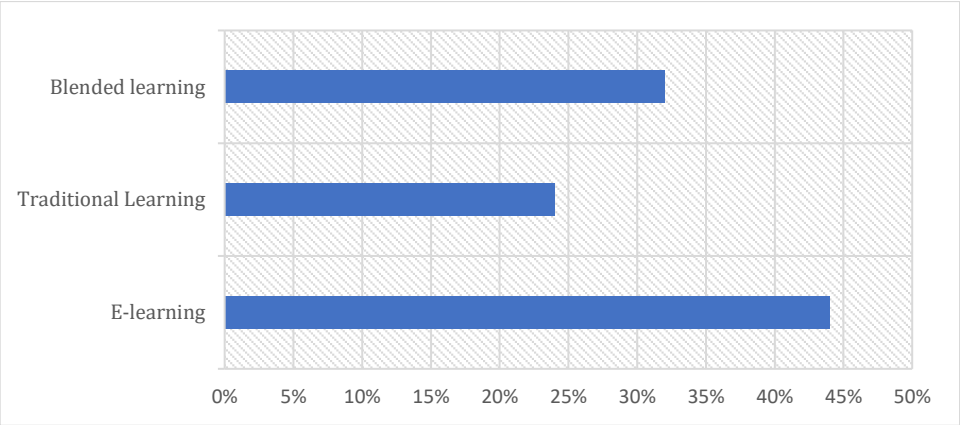


Fig. 6. Students' Learning types preferences

The researcher's data analysis showed that Cronbach's alpha coefficient was 0.853 for perceived usefulness items and 0.864 for perceived easiness items.

Table 1. Cronbach's Alpha coefficient

Scale	Cronbach's alpha	Items
Perceived Easiness	0.853	8
Perceived Usefulness	0.864	4

Our result indicated that 51.5% disagreed with and strongly disagreed that e-learning technology is easy to use. Furthermore, in our study, only 8.6 strongly agree that E-learning technology is easy to use.

However, researchers found the e-learning system easy to use by 5.36 mean [29]. The second item was regarding the quality of the online sessions; 33.5% agreed that Internet quality was excellent and online sessions were uninterrupted. A prior study noted that online learning sessions and Zoom sessions had experienced disruptions due to high demand for a limited number of servers in different regions [30]. Also, 33.5% reported that e-learning platforms had been adequately explained and trained.

Training, learning, and developing their skills in e-learning is a vital process. For instance, Participants in e-learning are required to demonstrate specific information technology skills, which are often above the level of elementary and secondary school students [31]. The last item of the perceived ease of use asked was whether e-learning tools were easy and intuitive, and the findings demonstrated that 21.2% agreed. An investigation indicated that the mean of the perceived easiness was 3.495 (unsure) about the easiness of e-learning [32].

On the other hand, we found that 32.6% agreed that the delivery of e-learning classes can be flexible. Also, an e-course's perceived usefulness is positively influenced by e-teaching [33]. Furthermore, only 20.7% disagreed that using e-learning classes saves them time. The respondents reported agreement by 38.5%. We found that 25.2% were still determining whether their competency would be enhanced using e-learning tools. Also, 40 % claimed that using e-learning tools enhances their learning ability more effectively and efficiently. We asked if e-learning tools enable them to control the learning process more effectively, and 40.2% agreed. The next item was about the benefit of e-learning in the education system. Our result showed that 35.2% indicated that the educational system would benefit from e-learning. The Last item in the perceived ease of use concerned e- Learning and learners' achievement. 39.3% agreed that using e-learning techniques can achieve better results/effects in their learning, and only 8.7% strongly disagreed. The perceived usefulness of internet-based MBA courses has been estimated at 3.51 based on previous research [34]. Table 2 to Table 4 shows the result of TAM instruments.

Table 2. Result of Perceived ease-of-use (PEOU) and Perceived usefulness (PU)

	Perceived Ease-of-use (PEOU) Items	Strongly Disagree	Disagree	Unsure	Agree	Strongly Agree	M (SD)
1.	E-learning technology is easy to use.	(22.2)	(29.3)	(17.4)	(22.5)	(8.6)	3.1 (1.28)
2.	Internet quality was good, and sessions online were uninterrupted	(10.2)	(22.8)	(19.7)	(33.5)	(13.9)	3.2 (1.22)
3.	The e-learning platforms have been adequately explained and trained.	(9.9)	(18.3)	(23.6)	(34.7)	(13.5)	3.2 (1.19)
4.	Using e-learning tools is easy and intuitive	(6.5)	(14.3)	(16.9)	(41.1)	(21.2)	3.3 (1.14)
	Perceived usefulness (PU) Items	**Strongly Disagree**	**Disagree**	**Unsure**	**Agree**	**Strongly Agree**	**M (SD)**
1.	The delivery of e-learning classes can be flexible (at different times and days of the week)	(11.4)	(19.5)	(21.3)	(32.6)	(15.2)	3.2 (1.24)
2.	The use of e-learning classes saves me time	(10.0)	(20.7)	(22.6)	(33.0)	(13.7)	3.2 (1.20)
3.	Using e-learning classes allows me to achieve learning effects more quickly.	(7.8)	(17.7)	(25.1)	(38.5)	(10.9)	3.3 (1.11)
4.	My competency will be enhanced by using e-learning tools.	(9.4)	(18.4)	(25.2)	(36.9)	(10.1)	3.2 (1.14)
5.	My ability to learn more effectively and efficiently is enhanced by using e-learning tools.	(10.2)	(15.9)	(23.0)	(39.7)	(11.2)	3.2 (1.18)
6.	Using e-learning tools enables me to control the learning process more effectively.	(6.5)	(14.5)	(18.4)	(40.2)	(20.4)	3.2 (1.14)
7.	The educational system would generally benefit from the use of e-learning	(9.0)	(18.4)	(26.8)	(35.2)	(10.5)	3.2 (1.13)
8.	Through the use of e-learning techniques, I can achieve better results/effects in my learning	(8.7)	(16.7)	(24.3)	(39.3)	(11.0)	3.3 (1.13)

Table 3. Result of Perceived ease of use (PEU)

Statement		M	S.D	SEM	VAR
1.	E-learning technology is easy to use.	3.1	1.28	0.059	1.176
2.	Internet quality was good, and sessions online were uninterrupted	3.2	1.22	0.057	1.105
3.	The e-learning platforms have been adequately explained and trained.	3.2	1.19	0.072	1.734
4.	Using e-learning tools is easy and intuitive	3.3	1.14	0.068	1.542
Perceived ease of use (EU) Items				(0.853)	

Table 4. Result of Perceived Usefulness (PU)

	Statement	M	S.D	SEM	VAR
1.	The delivery of e-learning classes can be flexible (at different times and days of the week)	2.578	1.225	0.067	1.501
2.	The use of e-learning classes saves me time	2.378	1.180	0.064	1.392
3.	Using e-learning classes allows me to achieve learning effects more quickly.	2.412	1.273	0.069	1.620
4.	My competency will be enhanced by using e-learning tools.	2.033	1.148	0.065	1.319
5.	Using e-learning tools enhances my learning ability more effectively and efficiently.	2.469	1.195	0.063	1.429
6.	Using e-learning tools enables me to control the learning process more effectively.	2.409	1.284	0.070	1.650
7.	The educational system would generally benefit from the use of e-learning.	2.584	1.301	0.071	1.693
8.	Through the use of e-learning techniques, I can achieve better results/effects in my learning	2.746	1.455	0.079	2.117
	Perceived usefulness (PU)			0.864	

This research examined participants' perceptions of e-learning by employing the Technology Acceptance Model (TAM) to understand better medical and health students' acceptance of technology use, specifically e-learning. TAM factors of perceived usefulness and ease of use were essential for this investigation. Researchers not only assessed device availability and internet accessibility; they also studied participants' preferred learning methodologies. The findings revealed a clear preference for blended learning over traditional and pure e-learning approaches, with the TAM model showing its validity in measuring acceptance, usefulness and ease of use are critical predictors for its adoption. The findings from this research chimed well with existing literature on technology acceptance and use in educational environments [27]. Notably, electronic devices, internet connectivity and perceived benefits associated with e-learning emerged as key drivers of its acceptance and use.

However, the study has its limitations. Reliance on participant self-reports introduces potential discrepancies in standards; therefore, it would be wiser to incorporate more diverse measures in future studies. Also, its cross-sectional design precludes causal inferences; therefore, longitudinal research must be performed to ascertain stability and causal relationships within the TAM model over time. Finally, the convenience sampling method restricts generalizability, especially in clinical settings.

Unwavering research in e-learning from users' perspectives must be considered. By understanding user needs and addressing perceived barriers, interventions can be tailored to increase engagement and satisfaction during e-learning experiences. With the pandemic-induced disruption to e-learning possibly changing perceptions among learners and educators alike, interventions must also adapt to boost engagement and satisfaction during online education experiences. A positive perception of the benefits of e-learning was essential to its successful implementation, particularly among health sciences students during the COVID-19 closure [35]. Furthermore, consumer-centred information tailored for intrinsic motivation was pivotal in adopting e-mental health interventions among clinicians.

Under these findings, educational institutions, particularly medical and health schools, should consider various facets before adopting e-learning despite its high adoption rate. Ensuring its suitability for instructors and learners while minimising potential distractions from the learning process are key concerns when assuming this technology-enhanced education. Furthermore, this study's insights demonstrate the need for a comprehensive approach that aligns technological advances with pedagogy to optimise an optimal e-learning experience.

Conclusion

The global educational landscape has been significantly transformed by the widespread adoption of E-Learning, offering a multitude of advantages for both educators and learners alike. The dissolution of geographical barriers has empowered students to access knowledge tailored to their circumstances, thereby reaping the rewards of this flexible mode of education. This investigation has been directed towards understanding the perceptions and embrace of E-Learning among medical and health students in Saudi Arabia, particularly during the COVID-19 lockdown. 99% of the respondents had the requisite technological tools for engaging with E-Learning.

Through a comprehensive exploration of learning preferences, the findings have unveiled intriguing insights. A substantial 45% of students preferred E-Learning, 32% favoured a blended learning approach, and 23% adhered to the traditional classroom setting. However, it is noteworthy that a notable percentage, 29.3%, held reservations about the user-friendliness of E-Learning, with 22% vehemently opposing this notion. Conversely, 32.6% acknowledged the adaptability of E-Learning, juxtaposed against 19.5% who expressed scepticism.

Delving deeper into efficacy, the data revealed a balanced perspective. Approximately 16% of participants voiced doubts regarding the potency of E-Learning in enhancing the efficiency and effectiveness of their educational journey, in contrast to a more optimistic 40% who endorsed its positive impact. Moreover, examining preferred learning methodologies highlighted a pronounced inclination towards blended learning, eclipsing traditional and E-Learning alternatives.

A particularly notable facet of this study rests in its affirmation of the Technology Acceptance Model (TAM) as a credible instrument for gauging the reception and utilisation of E-Learning. Remarkably, medical and health students demonstrated a commendable level of acceptance towards E-Learning, reflecting the evolving educational paradigms of our era.

However, it is pertinent to acknowledge that specific challenges persist, notably regarding the perceived ease of use, which resonated as a recurring concern.

Conflict of Interest

The authors declare that there is no conflict of interest.

References

[1] K. Walsh, Oxford textbook of medical education. Oxford University Press, 2013.
[2] B. Holmes and J. Gardner, E-learning: Concepts and practice. Sage, 2006.
[3] E. Warnecke and S. Pearson, "Medical students' perceptions of using e-learning to enhance the acquisition of consulting skills," Australas. Med. J., vol. 4, no. 6, p. 300, 2011.
[4] H. Esmaeeli, S. Rahmani, A. Kazemi, and M. Ali Ahmadi, "Evaluation of E-Learning of the virtual learning program from the student's point of view," Public Manag. Res., vol. 9, no. 34, pp. 203–222, 2016.
[5] L. Yekefallah, P. Namdar, R. Panahi, and L. Dehghankar, "Factors related to students' satisfaction with holding e-learning during the Covid-19 pandemic based on the dimensions of e-learning," Heliyon, vol. 7, no. 7, p. e07628, 2021.
[6] V. Gherheş, C. E. Stoian, M. A. Fărcaşiu, and M. Stanici, "E-learning vs face-to-face learning: Analyzing students' preferences and behaviors," Sustainability, vol. 13, no. 8, p. 4381, 2021.
[7] J. Potomkova, V. Mihal, and C. Cihalik, "Web-based instruction and its impact on the learning activity of medical students: a review," Biomed Pap Med Fac Univ Palacky Olomouc Czech Repub, vol. 150, no. 2, pp. 357–61, 2006.
[8] S. Barteit, D. Guzek, A. Jahn, T. Bärnighausen, M. M. Jorge, and F. Neuhann, "Evaluation of e-learning for medical education in low-and middle-income countries: A systematic review," Comput. Educ., vol. 145, p. 103726, 2020.
[9] S. Childs, E. Blenkinsopp, A. Hall, and G. Walton, "Effective e-learning for health professionals and students—barriers and their solutions. A systematic review of the literature—findings from the HeXL project," Health Inf. Libr. J., vol. 22, pp. 20–32, 2005.
[10] F. Colace, M. De Santo, and A. Pietrosanto, "Evaluation models for e-learning platform: an AHP approach," in Proceedings. Frontiers in Education. 36th Annual Conference, IEEE, 2006, pp. 1–6.
[11] N. A. Oye, N. Iahad, M. J. Madar, and N. Rahim, "The impact of e-learning on students' performance in tertiary institutions," Int. J. Comput. Netw. Wirel. Commun., vol. 2, no. 2, pp. 121–130, 2012.
[12] Q. N. Naveed, A. Muhammad, S. Sanober, M. R. N. Qureshi, and A. Shah, "A mixed method study for investigating critical success factors (CSFs) of e-learning in Saudi Arabian universities," methods, vol. 8, no. 5, pp. 171–178, 2017.
[13] E. Beaunoyer, S. Dupéré, and M. J. Guitton, "COVID-19 and digital inequalities: Reciprocal impacts and mitigation strategies," Comput. Hum. Behav., vol. 111, p. 106424, 2020.
[14] A. Poortavakoli, M. Alinejad, and B. Daneshmand, "Designing a pattern for e-content development based on the factors affecting satisfaction in e-learning," Technol. Educ. J. TEJ, vol. 15, no. 1, pp. 119–138, 2020.
[15] M. Tagoe, "Students' perceptions on incorporating e-learning into teaching and learning at the University of Ghana," Int. J. Educ. Dev. Using ICT, vol. 8, no. 1, pp. 91–103, 2012.
[16] F. M. Alsaaty, E. Carter, D. Abrahams, and F. Alshameri, "Traditional versus online learning in institutions of higher education: Minority business students' perceptions," Bus. Manag. Res., vol. 5, no. 2, pp. 31–41, 2016.
[17] A. Tratnik, M. Urh, and E. Jereb, "Student satisfaction with an online and a face-to-face Business English course in a higher education context," Innov. Educ. Teach. Int., vol. 56, no. 1, pp. 36–45, 2019.
[18] N. T. Butz, R. H. Stupnisky, and R. Pekrun, "Students' emotions for achievement and technology use in synchronous hybrid graduate programmes: A control-value approach," Res. Learn. Technol., vol. 23, 2015.
[19] B. S. Stern, "A comparison of online and face-to-face instruction in an undergraduate foundations of American education course," Contemp. Issues Technol. Teach. Educ., vol. 4, no. 2, pp. 196–213, 2004.
[20] F. D. Davis, "Perceived usefulness, perceived ease of use, and user acceptance of information technology," MIS Q., pp. 319–340, 1989.

[21] A. A. Alhur, "The Effectiveness of E-learning in Saudi Arabia During the Spread of COVID-19," Int. J. Adv. Res. Educ. Soc., vol. 3, no. 4, pp. 156–165, 2021.
[22] A. Alhur, "Exploring Saudi Arabia Individuals' Attitudes toward Electronic Personal Health Records," J. Comput. Sci. Technol. Stud., vol. 4, no. 1, pp. 80–87, 2022.
[23] A. Alhur, "An Investigation of Nurses' Perceptions of the Usefulness and Easiness of Using Electronic Medical Records in Saudi Arabia: A Technology Acceptance Model: Technology Acceptance Model," Indones. J. Inf. Syst., vol. 5, no. 2, pp. 30–42, 2023.
[24] A. Alhur and A. A. Alhur, "The Acceptance of Digital Health: What about Telepsychology and Telepsychiatry?," J. Sist. Inf., vol. 18, no. 2, pp. 18–35, 2022.
[25] A. Alhur, "An Exploration of Nurses' Perceptions of the Usefulness and Easiness of Using EMRs," J. Public Health Sci., vol. 2, no. 01, pp. 20–31, 2023.
[26] A. Alhur, "An Exploration of Nurses' Perceptions of the Usefulness and Easiness of Using EMRs," J. Public Health Sci., vol. 2, no. 01, pp. 20–31, 2023.
[27] A. A. Alhur, "The effectiveness of e-learning in Saudi Arabia during the spread of COVID-19," Int. J. Adv. Res. Educ. Soc., vol. 3, no. 4, pp. 156–165, 2021.
[28] A. Alhur and A. A. Alhur, "The Acceptance of Digital Health: What about Telepsychology and Telepsychiatry?," J. Sist. Inf., vol. 18, no. 2, pp. 18–35, 2022.
[29] S. Y. Park, "An analysis of the technology acceptance model in understanding university students' behavioral intention to use e-learning," J. Educ. Technol. Soc., vol. 12, no. 3, pp. 150–162, 2009.
[30] A. Choi, M. Karamollahi, C. Williamson, and M. Arlitt, "Zoom session quality: A network-level view," in Passive and Active Measurement: 23rd International Conference, PAM 2022, Virtual Event, March 28–30, 2022, Proceedings, Springer, 2022, pp. 555–572.
[31] B. Kolodziejczak and M. Roszak, "ICT competencies for academic E-learning. Preparing students for distance education-authors' proposal," Int. J. Inf. Commun. Technol. Educ., vol. 6, no. 3, pp. 14–25, 2017.
[32] R. G. Saadé and D. Kira, "Computer anxiety in e-learning: The effect of computer self-efficacy," J. Inf. Technol. Educ. Res., vol. 8, no. 1, pp. 177–191, 2009.
[33] D. Keržič, N. Tomaževič, A. Aristovnik, and L. Umek, "Exploring critical factors of the perceived usefulness of blended learning for higher education students," PloS One, vol. 14, no. 11, p. e0223767, 2019.
[34] J. B. Arbaugh, "Virtual classroom characteristics and student satisfaction with internet-based MBA courses," J. Manag. Educ., vol. 24, no. 1, pp. 32–54, 2000.
[35] N. K. Ibrahim et al., "Medical students' acceptance and perceptions of e-learning during the Covid-19 closure time in King Abdulaziz University, Jeddah," J. Infect. Public Health, vol. 14, no. 1, pp. 17–23, 2021.

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