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Factors effects on e-learners' satisfaction at the higher education institutions in Saudi Arabia

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Article Info	ABSTRACT
	To give e-learners enough freedom during their learning experiences, interactive learning, or "e-learning" as it is more commonly known, uses information and communication technologies. Because it provides e-learners with several benefits, e-learning has garnered a lot of attention in the education sector during the COVID-19 epidemic. This study's primary goal is to assess how internet connection (ICS) and service quality (SVQ) affect e-learner satisfaction (ELS). This study assessed the effects of factors (service quality and internet connection) on e-learner satisfaction in Saudi Arabian higher education institutions. The investigation was carried out using a quantitative technique. Information was acquired from Saudi Arabian universities. A total of 350 questionnaires were reviewed. The relationship between factors (service quality and internet connection) and their effect on the satisfaction of e-learners was examined using structural equation modeling (AMOS SEM). The study's results demonstrated that factors including SVQ and ICS have a positive effect on how satisfied e-learners are. This article recommends that responsible authorities pay special attention to ensuring quality and existing regulations and standards to address the issues that could affect ELS with e-learning in Saudi Arabian higher education institutions.

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1. INTRODUCTION

Electronic learning (e-learning) is the process of learning through the use of information and communications technology (ICT) tools that streamline in-person and remote instruction [1]. This kind of education provides information and abilities on a level with those of traditional schools. The principal advantage of this mode of instruction is that it permits e-learners to study at their own pace, from any location on the globe, and at any degree of intensity [2]. Additionally, as there is an increasing need for knowledge, e-learners should locate more resources to aid and develop their learning process [3]. Further, the COVID-19 has forced all colleges, universities, and schools across the globe to implement e-learning [4]. E-learners have developed electronic capacity to assist them in focusing on their course requirements, which is one advantage of using e-learning in education, especially in higher education institutions [5].

All facets of human existence, including health, have been negatively impacted by the unexpected COVID-19 pandemic [6], financial system [7], in the community [8], buying and selling [9], in education [10], and management. In particular, the COVID-19 pandemic has prevented 1.2 billion youngsters from attending school [11]. To keep the educational system functioning in this way, electronic learning, or e-learning, has proven crucial. The intentional use of communication and informational tools to speed up the

learning process is known as e-learning. Alternatively, it is known as the digital learning process or online learning [12]. E-learning in particular benefits e-learners with features like remote learning, customizable learning techniques, consistency in learning, time-saving, tracking choices, low cost, quick response, and interactive learning methods [13]. Despite the many benefits that e-learning may provide for students or e-learners, it has been discovered that Saudi Arabia's e-learning systems still struggle to provide the e-learning environment with high-quality information and services [14]. The primary challenges to implementing high-quality e-learning in Saudi Arabia are a lack of expertise and experience, such as poor information quality, poor service quality, high costs, a lack of internet access, management problems, a lack of interest, and behavioral problems [14]. In this context, the study examined the effectiveness of factors such as internet connection and service quality on the satisfaction levels of e-learners and evaluated the effects of service quality and internet connection on e-learner satisfaction.

One of the most important areas of research in educational technology in recent years has been the idea of e-learning, a method of technology-mediated learning with immense educational potential [15]. Regarding this, Rodrigues *et al.* [16] defines it as a more comprehensive approach to education. E-learning creates new chances for learning and teaching in a variety of subject areas outside of the traditional classroom setting [16]. E-learning, which was created by combining technology with education, is currently a powerful tool for education, especially when using internet technologies. Due to the clear benefits of e-learning in education, there has been a significant increase in the number of e-learning systems and applications that provide different services [17]. E-learning is now regarded as a crucial component of the Saudi educational system. It offers learners flexibility in the classroom, scalability, consistency, and an efficient learning process to guarantee their satisfaction. It also offers opportunities for distance learning, timely lesson delivery, updated content, and improved knowledge efficacy [5]. On the other hand, the COVID-19 pandemic has made the e-learning process crucial to the continued existence of Saudi Arabia's educational system. Further, service quality (SVQ), internet connection (ICS), and e-learner satisfaction (ELS) are explained in detail.

As a multidimensional construct, SVQ enables comparisons between perceived service seekers' expectations and perceived service providers' performance [18]. Examine the relationship between ELS and the effectiveness of the service providing e-learning [19]. The results of the study demonstrate that in addition to e-learning, course materials, and support SVQ, which are both reliant on system quality to ensure ELS, SVQ is viewed as a crucial dimension of ensuring ELS. The study thus shows a substantial connection between SVQ and ELS [20].

According to Abbate [21], a system of networks known as the "internet" employs two or more computing devices to transfer data or information and to promote communication between the many parties involved. However, while accessing the internet for whatever reason, an ICS refers to a dependable ICS [22]. The quality of the system, the upkeep of the software and hardware resources, and the level of learner satisfaction with e-learning are essential factors to consider.

In general terms, satisfaction is a complex, value-laden concept that can also be seen as a declaration of happiness with an anticipated outcome [23]. When using e-learning, ELS refers to the notion that students are satisfied with their ability to access the information system and meet their information needs [24]. The study's hypothesis development was covered in the next part.

Service quality is examined as a multidimensional construct when comparing the perceived behavior of service providers and perceived service seekers [18]. Analyze e-learners and the level of service that the e-learning environment offers to its customers. E-learning, course materials, and support SVQ are the other two criteria that rely on system quality to ensure the satisfaction of e-learners. The study shows that SVQ is regarded as the most essential component in ensuring the satisfaction of e-learners. The study concludes that there is a significant link between ELS and SVQ [19]. The following hypothesis is proposed in light of the prior discussion: SVQ has a positive effect on ELS (H1).

To achieve a specific goal or objective, such as acquiring information and fostering communication, two or more computers, smartphones, or other devices must be connected to the internet. Running e-learning activities with a solid ICS is a requirement that has a big impact on determining how satisfied students are with the e-learning systems [25]. We surveyed the opinions of learners who use the Internet. The research revealed that since its inception, the internet has played a commendable role in terms of obtaining limitless knowledge, receiving the most recent news, submitting educational documents, and the application procedure. In particular, the study emphasizes how the internet has revolutionized the way that people learn, providing them with a wealth of resources [26]. As a result, this investigation suggests a hypothesis that: ICS has a positive effect on the ELS (H2).

Figure 1 conceptual framework shows the connections between the variables considered in determining how satisfied e-learners are with the results. Regarding this, the conceptual framework that follows shows the relation between the variables that evaluated the factor's effects on ELS at higher education institutions in Saudi Arabia. Particularly, this framework has specifically highlighted the independent and dependent variables used in this research.
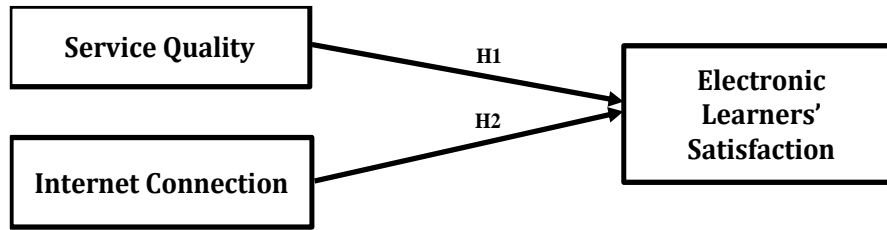
Figure 1. Conceptual framework

2. METHOD

This study aims to describe how e-learner satisfaction at Saudi Arabia's higher education institutions is influenced by service quality and internet connection stability. To find out how service quality and internet connectivity impacted electronic learners' satisfaction, the study used quantitative approaches. Additionally, inferential analysis and reliability validity were used to evaluate the data to determine the relationship among the variables.

2.1. Sample and population

A target population, according to Hair *et al.* [27] is a predetermined set of individuals or objects that can be questioned or watched to get the necessary data structures and knowledge. The sample size is an important factor in any research that aims to infer population-level information from a sample. The number of units that must be surveyed to provide reliable findings is the same as the sample size [28]. However, 163 men and 187 women made up the 84% of respondents who answered. Additionally, 25.1% of the participants were in the 30 to 40 age range. To conduct the study quantitatively, a questionnaire was employed to gather quantitative data from various higher education institutions in Saudi Arabia among undergraduate-level students. A total of 370 questionnaires were distributed; 350 valid surveys were accepted since the recommendation said that they were considered to be a good representative of the target population [29]. Thus, 20 surveys were excluded from this research because of missing values; only 350 were examined without any missing values.

2.2. Questionnaire

The questionnaire, which was used as the main technique for data collection, had open-ended questions. The open-ended questions ask for all conceivable responses or pre-written response groups. After the questions are presented, respondents are prompted to select their answers. In quantitative research, statistics are generated using this method of inquiry [30]. Reliability is determined by the consistency of the instrument used to measure a concept in research [31]. A questionnaire on a seven-point Likert scale (1-strongly disagrees to 7-strongly agrees) was presented to respondents. Reliability and validity have been considered in order to evaluate the quality of this study. Specifically, validity and reliability in this study were concerned with how the suggested procedure, test, or method assessed the study goals.

2.3. Data collection procedure

The researcher gave questionnaires to online students at several Saudi Arabian higher education institutions. The researcher requested that the responsible department complete the surveys. The responsible department was requested by a researcher to take part in the study and send questionnaires for data collection. Each query is a contribution from the department leaders to the online learners. The research questionnaires included encouragement and assurances of respondents' confidentiality and anonymity. For the respondents, about 370 questionnaires were given out. However, just 350 questionnaires were received. A total of 20 completed surveys were rejected because they had duplicate and incomplete responses.

2.4. Data analysis

Data analysis is the process of looking at the information gathered during an experiment or survey and drawing inferences and conclusions [31]. AMOS structural equation modeling (SEM) was utilized by the author to analyze the data. This efficient approach included traditional multivariate analysis, which helped the author analyze the data [32]. This program was selected due to its compatibility with the current study and its verification.

3.   RESULTS AND DISCUSSION

3.1.   Convergent validity and reliability

To guarantee that the "factor loading and average variance extracted (AVE) are higher than 0.70 and 0.50 to fully fulfill the criteria of acceptance," as indicated in previous studies [33], [34]. During the development of the measurement model, the model's convergent validity and reliability were first evaluated. Table 1 demonstrates that this requirement is met by all pertinent values.

3.2.   Discriminant validity

The results of the variable's correlation, which was used to assess the measurement's discriminant validity, are displayed in Table 2. To get to the stage of convergent validity examination, the average values must be at least 0.50 AVE and the factor loads must be equal to or greater than 0.70. According to a study by Henseler et al. [35], Table 2 shows that every latent construct measurement was completely discriminatory.

3.3.   Hypothesis

The hypothesis test indicates that all hypotheses have a favorable direct effect and are therefore accepted, as shown in Table 3. The p-value for ELS and the SVQ composite reliability (CR) value were 7.722 and 0.000, respectively. The p-value of ELS and the ICS CR value were 9.881 and 0.000, respectively. Thus, H1 and H2 were therefore supported.

3.4.   Discussion

The analysis's results show a positive relationship between internet access and ELS that is positive, supporting hypothesis H1. This conclusion is consistent with the previous research findings [26], [36]. Numerous studies have shown that learners' satisfaction with their e-learning experience is significantly influenced by ICS [26], [36]–[44]. As has been shown, an ICS is crucial to ELS, which is a critical metric of a system's effectiveness.

The research supports hypothesis H2 by supporting SVQ and ELS. This result agrees with the previous studies [20], [45]. Various research investigations have demonstrated that the quality of service has a major impact on learners' satisfaction with their e-learning experience [20], [45]–[53]. The significant effects of service dimensions on satisfaction thus imply that these elements are crucial for obtaining satisfaction, better value, and competitiveness [54]. Finally, for practical contribution, this study offers suggestions on how educational establishments might successfully integrate the e-learning system to help students with their education.

Table 1. Results of convergent validity and reliability

Constructs	Items	Loading	CR	AVE
ICS	ICS1	0.805	0.899	0.640
	ICS2	0.803		
	ICS3	0.770		
	ICS4	0.811		
	ICS5	0.811		
SVQ	SVQ1	0.783	0.887	0.612
	SVQ2	0.772		
	SVQ3	0.724		
	SVQ4	0.814		
	SVQ5	0.815		
ELS	ELS1	0.794	0.898	0.596
	ELS2	0.781		
	ELS3	0.742		
	ELS4	0.769		
	ELS5	0.768		
	ELS6	0.775		

Table 2. Results of decrement validity

Constructs	ICS	SVQ	ELS
ICS	0.800		
SVQ	0.692	0.782	
ELS	0.738	0.689	0.772

Table 3. Hypotheses result

H	Path	Estimates	St. deviation	CR	R-value	Decision
H1	SVQ→ELS	0.418	0.052	7.722	0.000	Supported
H2	ICS→ELS	0.572	0.049	9.881	0.000	Supported

4.   CONCLUSION

The results of this study indicate a significant relationship between internet connectivity, service quality, and e-learner satisfaction with online courses. A system's capacity for adaptation indeed has a major impact on ELS, a key indicator of a system's effectiveness. The study also demonstrates the link between an ICS and e-learners' pleasure. Because of this, these features may be essential for obtaining satisfaction, greater value, and competitiveness, given the ICS dimensions' strong impact on satisfaction. The technical infrastructure that enables extensive, inexpensive access to high-quality information and services is required because Saudi Arabia's higher education system recognizes the value of online learning. Organizational human infrastructure must be improved for the benefit of electronic learners and for participants to utilize technology with ease. To support the expansion and success of online learning across Saudi Arabia's higher education institutions, it is necessary to update, alter, and modify the necessary laws and regulations. The standard of online learners' satisfaction in terms of delivery would rise as a result of such continuous reviews and modifications.

Since online learning is acknowledged in Saudi Arabian higher education, it is important to develop the technology infrastructure that enables widespread, low-cost access to high-quality information and services. Institutions' human infrastructure needs to be enhanced for students to readily use technology and participate in e-learning. It is required to update, revise, and modify the appropriate rules and regulations to support the growth and success of online learning throughout Saudi Arabia's higher education system. The quality of e-learning as it is delivered would increase as a result of such constant evaluations and adjustments. The present research has some limitations, including a small sample size and the inclusion of only participants from one industry. The study model can be evaluated in the future with a larger sample size and in various industries. The model could be evaluated in future studies by gathering data with a longitudinal methodology. Future studies should therefore concentrate on the problems that institutions are having with online learning and any potential remedies. Finally, not all of the factors that influence how satisfied e-learners are with their e-learning experience are considered in this study. Future research may examine mediating factors like credibility, image, or confidence.

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