Factors Influence Saudi Females' Attitudes Towards the Use of E-learning for Continuing Education

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Abstract
This research aimed to investigate the relationship between self-determination and Saudi females' attitudes towards the use of e-learning for continuing education, as well as the moderating effect of perceived ease of use and usefulness of e-learning on the self-determination and attitudes relationship, and the mediating role of subjective norms in the relationship between self-determination and Saudi females' attitudes towards e-learning. The study used a quantitative research design, with data collected via an online survey. The Saudi women in the sample are engaged in continuing education programs. This paper adopted the self-determination theory along with technology acceptance model to create the conceptual framework, and the conceptual framework was tested using structural equation modeling (SEM). The findings of the study have both practical and theoretical implications for encouraging Saudi females to continue their education, through e-learning platforms. Finding of the research emphasis the important of self-determination to motivate learner to engaged in the e-learning in general and in the continues learning in particular.

Keywords: Self-Determination, E-learning, Technology Acceptance and Continues Education

1. Introduction

Technology plays a crucial role in e-learning, and you could explore the ways in which technology can enhance the learning experience for individuals engaged in continuing education (Shahzad, Khan et al. 2023). In Saudi Arabia, e-learning has emerged as a viable option for continuing education, particularly for females who face some challenges when it comes to attending traditional classroom-based courses (Al-Mamary, Siddiqui et al. 2023). It is particularly important in today's rapidly evolving job market, where continuous learning is required to remain competitive. It is particularly important in today's rapidly evolving job market, where continuous learning is required to remain competitive (Gerasymova, Maksymchuk et al. 2019). E-learning has been recognized as an effective mode of delivery for continuing education programs (Kannadhasan, Shanmuganantham et al. 2020). It has the potential to overcome some of the barriers faced by traditional classroom-based continuing education programs, such as limited access to resources, inflexible schedules, and geographic constraints (Al Rawashdeh, Mohammed et al. 2021). E-learning provides learners with the ability to learn at their own pace, in their own time, and in a location that suits them (Sokyrska, Buha et al. 2023; Alam and Mohanty 2023; Angib, Asinde et al. 2022). The concept of e-learning has diversified in educational literature. E-learning refers to the process of learning and receiving information through the use of electronic devices and multimedia technologies. It involves communication between learners and teachers through various communication channels. The process of education takes place according to the learner's conditions, preparedness, and abilities, with the primary responsibility for learning resting on the learner (Al Hadid 2022). E-learning, refers to the use of technology to deliver educational and facilitate learning experiences (Pramita, Sukmawati et al. 2021). e-learning has become a popular method of delivering continuing education through the last years due to internet fast deployment. eLearning allow learners to access education and training materials from any location and at any time (Al Rawashdeh, Mohammed et al. 2021). This research aimed to explore the factors that influence Saudi females' attitudes towards the use of e-learning for continuing education. understanding the factors that influence Saudi females' attitudes towards e-learning is important to improving their access to education. Although there are well establish literature in the powerful use of eLearning in education (Ratnawati and Idris 2020; Zhao, He et al. 2020; Karataş and Tuncer 2020). Still there are need for researches to determine to identify the factors that contribute to learner attitudes towards and intention to adopt this learning method. Studies have been conducted to investigate the effectiveness of e-learning for continuing education. The research question was: What is the relationship between self-determination and attitudes towards the use of eLearning for continuing education among Saudi females, and how are these relationships moderated by perceived ease of use and usefulness of e-learning platforms, and mediated by social norm. Based on the research question, the goals of this study are: (1) to examine the relationship between self-determination and attitudes towards the use of eLearning for continuing education among Saudi females. (2) to explore the moderating role of perceived ease of use and usefulness of e-learning platforms on the relationship between self-determination and attitudes towards the use of eLearning for continuing education. (3) to investigate the mediating role of social norms in the relationship between self-determination and attitudes towards the use of eLearning for continuing education. (4) to provide practical and theoretical implications for improving the effectiveness of continuing education programs, particularly for Saudi females.

2. Literature Review

The concept of e-learning has diversified in educational literature. E-learning refers to the process of learning and receiving information through the use of electronic devices and multimedia technologies. It involves communication between learners and teachers through various communication channels. The process of education takes place according to the learner's conditions, preparedness, and abilities, with the primary responsibility for learning resting on the learner (Al Hadid 2022). E-learning, refers to the use of technology to deliver educational and facilitate learning experiences (Pramita, Sukmawati et al. 2021). Jethro, Grace et al., (2012) defined it as the provision of electronic educational content through multimedia and computer networks to learners in a way that enables them to actively interact with this content, as well as with the teacher and their peers. E-learning refers to learning that takes place through electronic media, such as the internet, audio, and video. e-learning refers to a form of education or training that is delivered using electronic technologies such as computers, mobile devices, or the internet (Kim, Hong et al. 2019). Several studies have explored the effectiveness of e-learning compared to traditional classroom education sittings (Rovai, Ponton et al. 2007; Pramita, Sukmawati et al. 2021). e-learning has become a popular method of delivering continuing education through the last years due to internet fast deployment. eLearning allow learners to access education and training materials from any location and at any time (Al Rawashdeh, Mohammed et al. 2021). eLearning can be instructor-led or self-paced (Rustamov 2020). it is considered as tool for distance education or remote learning, it is also helpful for the-job training and professional development (Karataş and Tuncer 2020). Studies have investigated the impact of e-learning on learning outcomes. (Ratnawati and Idris 2020), found that e-learning systems were effective in improving students' knowledge and skills. Also, a meta-analysis by (Zhao, He et al. 2020) found that students who participated in online learning performed better than those who received traditional learning. Although there are well establish literature in the powerful use of eLearning in education (Ratnawati and Idris 2020; Zhao, He et al. 2020; Karataş and Tuncer 2020), still there are need for researches to identify the factors that contribute to learner attitudes towards and intention to adopt this learning method. Studies have been conducted to investigate the effectiveness of e-learning for continuing education. For example, (Peterkin 2022), examined the effectiveness of computer-based training (CBT) for job-related skills training and found that CBT was more effective than traditional classroom training. Also, Chaves, Lorca-Marín et al. (2020) compared the effectiveness of e-learning with the traditional training for professionals in healthcare and found that e-training was as effective as traditional training in knowledge acquisition. Moreover, Schmid, Borokhovski et al. (2023) conducted a meta-analysis of online learning, blended learning, the flipped classroom and classroom instruction for pre-service and in-service teachers the found the blended/flipped approaches are significantly superior to classroom-based instruction.

Continuing education refers to the process of acquiring new knowledge and skills throughout one's life after the completion of formal education (Jarvis 1995). It is a form of education or training that individuals pursue after completing their initial education, typically to update or enhance their knowledge and skills in their chosen profession or field (Eraut, 2004). Continuing education can take many forms, including attending workshops, conferences, online courses, or other educational programs designed to provide ongoing learning opportunities (Jarvis 1995; Klein and Ware 2003). The goal of continuing education is to enable individuals to keep up with the latest advancements and best practices in their field, as well as to improve their job performance and career prospects (Knowles, Holton III et al., 2020). It is essential for professionals to maintain their competencies and stay up-to-date with

the latest advancements in their field (Hamilton 1992). Continuing education has positive outcomes for professionals, organizations, and society. According to Kuznia and Ellis (2014) the participation in online continuing education programs led to an increase in employees' productivity and efficiency. In addition, Demiral (2017) found that participation in training programs led to an increase in job satisfaction and motivation among employees. The effectiveness of continuing education programs depends on various factors, including the program's design, delivery, and content. Therefore, it is crucial to consider these factors when designing and implementing continuing education programs (Collin, Van der Heijden et al. 2012). CE is important in today's rapidly evolving work environment, as it allows individuals to update their skills and knowledge to remain competitive in their fields (Shah, Sterrett et al. 2001). In spot the importance of CE, there are some barriers that prevent individuals from pursuing it. One of the major barriers is scarceness of time (Penz, D'Arcy et al. 2007). Many individuals have busy life style and find it difficult to take time out for CE. In their study in rural and remote registered nurses in Canada Penz, D'Arcy et al., (2007) found that the isolation of rural nurses, time and financial constraints are the major barriers to participation in continuing education activities. This is particularly true for individuals from low-income families. Also, Kazakova and Shastina (2019) found that language and cultural barriers were significant challenges for international students pursuing higher education in the United States. Moreover, lack of motivation and self-discipline are additional barriers to CE (Costello, Kafchinski et al. 2011). Studies have shown that E-learning is an effective means of delivering continuing education to people (Yu, Chen et al. 2007, Rolstadås 2013). e-learning considered as an effective means of delivering CE as it allows people to learn at their own pace and on their own schedule (Blezu and Popa 2008).

The effectiveness of e-learning is influenced by several factors. Blezu and Popa (2008), found that clear learning objectives and goals, active engagement and interaction, frequent and meaningful feedback, opportunities for collaboration and social interaction, and well-designed and organized course content are important factors associated with overall outcomes of e-learning. Maatuk, Elberkawi et al., (2022) mentioned additional factors, such as motivation and prior knowledge, and instructor factors, such as pedagogical strategies and technical expertise. The design and implementation of e-learning courses can also impact the effectiveness of this instructional approach (Brown and Voltz 2005). Koumi (2006) stated that courses incorporated multimedia, for example: videos and interactive simulations that allowed for flexible pacing and sequencing of learning are more activities. Moreover, the clear and frequent communication between instructors and students in e-learning environments are raised as important factor that influence the effectiveness of e-learning. Engagement is a crucial factor for effective learning, as it reflects learners' motivation and interest in the learning process (Bhuasiri, Xaymoungkhoun et al. 2012). Gikandi, Morrow et al., (2011) emphasized the importance of fostering a supportive learning community, promoting learner autonomy, and providing timely feedback to enhance engagement. Learners' attitudes towards the eLearning are important in determining learners' decision in adopting it. Studies have investigated the factors that influence learners' attitudes towards e-learning. For example, Venkatesh, Rao et al., (2020) found that learners' attitudes towards technologies were positively associated with their expectations of it. According to Rhema and Miliszewska (2014), students had positive attitudes towards e-learning, but that attitude varied depending on factors such as age, gender, and prior experience with technology. Several factors may influence students' attitudes towards e-learning (Bertea 2009). According to Martínez-Argüelles, Castán et al., (2009) students' attitudes towards e-learning were positively associated with the quality of e-learning materials and resources. Therefore, we can suggest that:

H1: There is significant positive relationship between females' attitudes towards the use of eLearning for continues education and their intention to enrolled in eLearning course.
H2: There is significant positive relationship between females' self-determination and their attitudes towards the use of eLearning for continues education.
H2a: There is significant positive relationship between females' perception of their autonomy in using eLearning and their attitudes towards the use of eLearning for continues education.
H2b: There is significant positive relationship between females' perceived competence to use eLearning and their attitudes towards the use of eLearning for continues education.
H2c: There is significant positive relationship between females' perceived relatedness in eLearning and their attitudes towards the use of eLearning for continues education.
H8: There are significant positive moderating role of perceived ease of use, perceived usefulness in the relationship between self-determination and students' attitudes the use of eLearning for continues education.
H8a: There are significant positive moderating role of perceived ease of use in the relationship between perceived autonomy and students' attitudes the use of eLearning for continues education.
H8b: There are significant positive moderating role of perceived ease of use in the relationship between perceived competence and students' attitudes the use of eLearning for continues education.
H8c: There are significant positive moderating role of perceived ease of use in the relationship between perceived relatedness and students' attitudes the use of eLearning for continues education.
H8d: There are significant positive moderating role of perceived usefulness in the relationship between perceived autonomy and students' attitudes the use of eLearning for continues education.
H8e: There are significant positive moderating role of perceived usefulness in the relationship between perceived competence and students' attitudes the use of eLearning for continues education.
H8f: There are significant positive moderating role of perceived ease of use in the relationship between perceived relatedness and students' attitudes the use of eLearning for continues education.
H9: There are significant positive mediating role of subjective norms in the relationship between self-determination and attitudes towards the use of eLearning for continuing education.
H9a: There are significant positive mediating role of subjective norms in the relationship between perceived autonomy and attitudes towards the use of eLearning for continuing education.
H9b: There are significant positive mediating role of subjective norms in the relationship between perceived competence and attitudes towards the use of eLearning for continuing education.
H9c: There are significant positive mediating role of subjective norms in the relationship between perceived relatedness and attitudes towards the use of eLearning for continuing education.

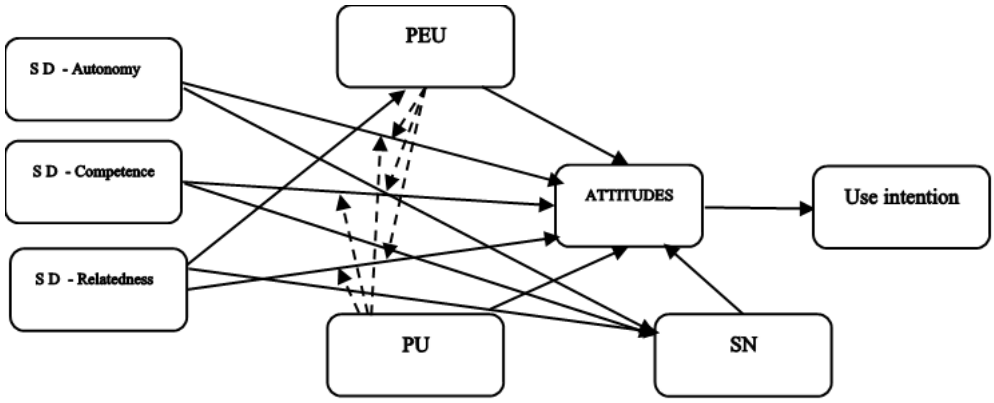

Figure 1: research model.

3. Data Collection and Analysis

Field investigations were conducted to examine the research hypotheses. The study looked at the link between three motivational factors and the attitudes towards the use of eLearning. The data used to test the research model were obtained from Saudi females' residence in Saudi Arabia. An Arabic version of the questionnaire was designed to be placed as Web-based survey on google forms. Web-based surveys have been used in previous studies (Harp and Mayer 1997; Negash, Ryan et al. 2003). The link to the online survey was distributed in WhatsApp groups that are interested in eLearning platforms. The number of members in the WhatsApp groups are limited in number what effects the total number of participants in the survey. Data collection took one month. Start in first of march 2023 and ended in first of April 2023. A total of 210 responses were received. Since 8 questionnaires were incomplete, a total of 202 usable surveys were used. Data in Table. 1, provides insights into the age, income and education distributions of the surveyed population.

Table 1. Descriptive statistics of participants

Controls	Range	Frequency	%
age	Under 18 years	1	.5
	18-24 years	51	25.4
	25-34 years	36	17.9
	35-44 years	45	22.4
	45-54 years	42	20.9
	55-64 years	19	9.5
	65 years or older	7	3.5
Education	Less than high school	3	1.5
	High school	32	15.9
	diploma	15	7.5
	Bachelor's degree	110	54.7
	Master's or Ph.D. degree	41	20.4
Income	Less than 1000 SAR	47	23.4
	1000 to 4999 SAR	40	19.9
	5000 to 9999 SAR	29	14.4
	10000 to 19999 SAR	65	32.3
	20000 to 29999 SAR	11	5.5
	30000 to 39999 SAR	2	1.0
	More than 40000 SAR	7	3.5

The measures used in this research were mainly adapted from relevant prior studies. All items were measured using a five-point Likert-type scale with anchors from ‘‘Strongly disagree’’ to ‘‘Strongly agree’’. The measurement of self-determination was adopted from (Zhang, 2023). Which included “autonomy,” four items. "competence” four items. “Relatedness.” four items. The measurements for perceived usefulness (3 items), and perceived ease of use (3 items) adopted from (Davis, Bagozzi et al., 1989). Items measuring Attitudes (3 items) adopted from (Oliver, 1980 and Spreng and Chiou, 2002). Items measuring use intention (3 items) were adapted from prior work by (Mathieson, 1991). Subjective norm (3 items) was adapted from prior work by (Ajzen 1985).

The present study used Smart PLS (4.0), a statistical tool to examine the data through partial least square equation modelling (PLS-SEM). This approach has gained much prominence in studies about technology acceptance, eLearning and related fields (Hair, Sarstedt et al. 2012; Tian, Iqbal et al. 2020; Hair, Ringle et al. 2011; Hair, Ringle et al. 2011). Hair, Ringle et al., (2011), suggested using PLS-SEM to predict dependent variables’ effects. This study uses PLS-SEM as a verified reporting approach to conduct robust analysis in the technology acceptance researches. SEM is a second-generation multifaceted data investigation method that examines theoretically developed linear and additive casual relationships (StatSoft 2013). It allows researchers to examine the relationships between constructs. SME is considered as the best approach to measure the direct and indirect paths because it analyses the difficult to examine and unobservable latent constructs. SEM consists of inner and outer model analyses, which examine the relationships between independent and dependent variables and relationships between latent constructs and their observed pointers. PLS focuses on variance analysis, which could be done using Smart PLS (Vinzi, Trinchera et al. 2010). Therefore, this approach is selected for the present study.

4. Results

The current study analyzed the measurement model to assess the reliability, composite reliability (CR) and average variance extracted (AVE) of the constructs. To measure the reliability, we have used Cronbach alpha (CA) and composite reliability. The results for CA and CR are presented in Table 2 for Autonomy (0.918, 0.942), Competence (0.939, 0.956), Relatedness (0.935, 0.953), Perceived Ease of Use (0.938, 0.956), Perceived Usefulness (0.938, 0.961), Attitudes (0.932, 0.956), Subjective norms (0.930, 0.955), and use intention (0.937, 0.960) respectively. According to Hair, Ringle et al., (2011), CA and CR values should be higher than 0.70, and this study found the values to be in an acceptable range. We assessed the Fornell Larcker and heterotrait –monotrait (HTMT) ratio to test the discriminant validity (Fornell and Larcker 1981). The HTMT ratio has recently gained preference over Fornell and Larcker (1981). Fornell and Larcker’s tests in Table 3 exhibit values greater than the correlations among the variables. The HTMT ratio results are lower than the 0.90 thresholds (see Table 4). Additionally, we examined the convergent validity to obtain AVE values (Table 2), and all the values were greater than the 0.50 threshold (for Autonomy, Competence, Relatedness, Perceived Ease of Use, Perceived Usefulness, Attitudes, subjective norms and use intention. the AVE values were 0.803, 0.845, 0.837, 0.880, 0.890, 0.880, 0.877 and 0.888, respectively).

Table 2. Measurement model

Construct	Item Code	Loading	Cronbach's alpha	CR	AVE
Autonomy			0.918	0.919	0.803
	A1	0.896			
	A2	0.910			
	A3	0.915			
	A4	0.862			
Competence			0.939	0.956	0.845
	C1	0.888			
	C2	0.928			
	C3	0.933			
	C4	0.927			
Relatedness			0.935	0.953	0.837
	R1	0.909			
	R2	0.933			
	R3	0.895			
	R4	0.921			
Perceived Ease of Use			0.938	0.956	0.880
	EOU1	0.936			
	EOU2	0.946			
	EOU3	0.949			
Perceived Usefulness	U1	0.939	0.938	0.961	0.890
	U2	0.952			
	U3	0.939			
Attitudes	ST1	0.924	0.932	0.933	0.880
	ST2	0.952			
	ST3	0.937			
Use intention			0.937	0.960	0.888
	INT1	0.952			
	INT2	0.952			
	INT3	0.924			
			0.930	0.955	0.877
Subjective norms	SN1	0.918			
	SN2	0.952			
	SN3	0.941			

Note:Composite reliability (CR); Average variance extracted (AVE).

Table 3. Heterotrait-monotrait ratio (HTMT) - Matrix

	Attitudes	Autonomy	Competence	PEOU	PU	Relatedness	SN	UI	PEOU x Autonomy	PEOU x Competence	PEOU x Relatedness	PU x Relatedness	PU x Competence	PU x Autonomy
Attitudes														
Autonomy	0.826													
Competence	0.806	0.822												
PEOU	0.820	0.816	0.822											
PU	0.825	0.823	0.901	0.827										
Relatedness8	0.816	0.816	0.812	0.810	0.845									
SN	0.823	0.820	0.776	0.755	0.831	0.779								
UI	0.819	0.818	0.845	0.775	0.819	0.764	0.827							
PEOU x Autonomy	0.374	0.300	0.348	0.477	0.387	0.353	0.299	0.341						
PEOU x Competence	0.413	0.319	0.409	0.536	0.432	0.398	0.342	0.360	0.913					
PEOU x Relatedness	0.393	0.344	0.422	0.499	0.422	0.334	0.323	0.346	0.827	0.730				
PU x Relatedness	0.441	0.385	0.439	0.416	0.499	0.386	0.381	0.382	0.830	0.813	0.810			
PU x Competence	0.495	0.452	0.524	0.418	0.542	0.406	0.414	0.459	0.789	0.831	0.826	0.829		
PU x Autonomy	0.459	0.418	0.479	0.365	0.495	0.378	0.375	0.411	0.825	0.773	0.786	0.709	0.750	

Note: Use Intention (UI); Perceived Ease of use (PEOU); Perceived Usefulness (PU); Subjective norm (SN).

Table 4. Discriminant validity (latent variable correlation and square root of AVE). Fornell-Larcker criterion

	Attitudes	Autonomy	Competence	PEOU	PU	Relatedness	SN	UI
Attitudes	**0.938**							
Autonomy	0.856	**0.896**						
Competence	0.848	0.856	**0.919**					
PEOU	0.815	0.759	0.774	**0.943**				
PU	0.865	0.811	0.845	0.777	**0.943**			
Relatedness	0.762	0.757	0.809	0.760	0.792	**0.915**		
SN	0.824	0.758	0.725	0.708	0.777	0.727	**0.937**	
UI	0.887	0.824	0.793	0.729	0.834	0.716	0.772	**0.942**

Note: Use Intention (UI); Perceived Ease of use (PEOU); Perceived Usefulness (PU); Subjective norm (SN).

The Smart PLS (4.0) software was used to assess the structured equation model using 5000 bootstraps. According to Henseler, Hubona et al. (2016), the standardized root means square (SRMR) values should be lower than 0.08 (for a sample size greater than 100). Thus, we found a significant model fit for this study (0.043). The values of determination of coefficient (R2) should be > 0.1 (Henseler, J.et al, 2016). This study found that, 0.859% variance occurred in attitudes, explained by (perceived ease of use, perceived usefulness, Autonomy, Competence and Relatedness, subjective norms). and 0.804% variance occurred on use intention explained by attitudes. And 0.666% variance occurred in perceived ease of use explained by Autonomy, Competence and Relatedness and 0.763% variance occurred in perceived usefulness explained by Autonomy, Competence, Relatedness and perceived ease of use.

Table 5. Hypothesis constructs

	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
Direct relationships				
Attitudes -> UI	0.887	0.022	39.864	0.000
Autonomy -> Attitudes	0.224	0.069	3.213	0.001
Autonomy -> SN	0.432	0.101	4.325	0.000
Competence -> Attitudes	0.165	0.099	1.713	0.087
Competence -> SN	0.092	0.117	0.770	0.441
PEOU -> Attitudes	0.236	0.081	3.047	0.002
PU -> Attitudes	0.233	0.088	2.635	0.008
Relatedness -> Attitudes	-0.093	0.074	1.427	0.154
Relatedness -> SN	0.326	0.098	3.305	0.001
SN -> Attitudes	0.251	0.064	3.840	0.000
Indirect effects (moderating)				
PEOU x Autonomy -> Attitudes	0.077	0.123	0.223	0.824
PEOU x Competence -> Attitudes	-0.093	0.113	0.712	0.476
PEOU x Relatedness -> Attitudes	0.069	0.110	1.055	0.291
PU x Relatedness -> Attitudes	0.043	0.100	0.098	0.922
PU x Competence -> Attitudes	0.056	0.123	0.306	0.760
PU x Autonomy -> Attitudes	-0.152	0.120	0.917	0.359
Indirect effect (mediating)				
Relatedness -> SN -> Attitudes	0.081	0.032	2.487	0.013
Autonomy -> SN -> Attitudes	0.108	0.037	2.921	0.004
Competence -> SN -> Attitudes	0.024	0.031	0.714	0.475

Note: Use Intention (UI); Perceived Ease of use (PEOU); Perceived Usefulness (PU); Subjective norm (SN); $p < 0.05$

Conclusion

As presented in table 5, results indicated a significant relationship between attitudes and UI. The T statistic (39.864) and the p-value of 0.000 suggested that attitudes have a strong impact on UI. The significant relationship between attitudes and UI implies attitudes have a profound effect on females' use of eLearning. In regards with the relationship between PEOU and attitudes, the analysis suggests that there is a significant relationship between PEU and attitudes. The T value of (3.047) and the p-value of 0.002 indicate that PEU has a strong significant impact on attitudes. This significant relationship implies that when individuals perceive a system or technology as easy to use, it positively influences their attitudes towards it. PEU can enhance user satisfaction, engagement, and adoption of a particular system or technology. This finding emphasizes the importance of designing user-friendly interfaces and intuitive systems to foster positive attitudes and user experiences (Venkatesh, Rao et al. 2020). In regards with the relationship between PU and attitudes, the analysis suggests that there is a significant relationship between PU and attitudes. This significant relationship implies that when individuals perceive a system or technology as useful, it positively influences their attitudes towards it. PU is an important factor in determining user acceptance and satisfaction with a particular system or technology (Davis, Bagozzi et al. 1989). This finding highlights the significance of designing and promoting systems that are PU in order to foster positive attitudes and user engagement. The analysis also suggested a significant relationship between SN and attitudes. The relatively T value of (3.840) and the p-value of

0.000 indicate a significant positive relationship between the two variables, and that SN has a strong impact on attitudes. SN can shape individuals' perceptions, opinions, and behaviors. Positive experiences, interactions, and content of other people who means a lot to the learner, can contribute to more favorable attitudes towards eLearning. Moreover, the finding also indicates that there is a significant relationship between autonomy and attitudes. The T value of (3.213) and the p-value of 0.001 indicate that autonomy has a significant impact on attitudes. This significant relationship between autonomy and attitudes implies that having a sense of autonomy positively influences attitudes. This finding highlights the importance of providing learners with a degree of control, independence, and decision-making power in education. When people feel a sense of autonomy in eLearning, it can contribute to more positive attitudes, engagement, and satisfaction. In regards with the relationship between competence and attitudes towards eLearning, results suggests that there is no significant relationship between competence and attitudes. The T value of (1.713) indicates no statistically significant relationship. In addition, based on analyzed data, the results suggests that there is no significant relationship between relatedness and attitudes. The T value of (1.427) and the p-value of 0.154 indicated that there is no significant relationship between the two variables. In addition, the analysis suggests that there is a significant relationship between autonomy and subjective norms. The high T value of (4.325) and the p-value of 0.000 indicate a significant relationship and that autonomy has a strong impact on SN. Moreover, the analysis suggests that there is no significant relationship between competence and SN. The T value of (0.770) and the p-value of 0.441 suggested that the relationship between SN and competence is low. The lack of a significant relationship between competence and SN implies that individuals' perceptions of their own competence may not strongly influence their acceptance of social networking opinion. In addition, the analysis suggests that there is a significant relationship between relatedness and SN. The relatively high T value of (3.305) and the low p-value of 0.001 indicate a significant relationship. This significant relationship implies that individuals who perceive a sense of relatedness, connection, and social support in their online interactions are more likely to accept social groups advices. Moreover, the analysis suggests that there is a significant relationship between autonomy and attitudes. The high T statistic of 3.213 and the low p-value of 0.001 indicate a significant relationship between the variables. This suggests that autonomy has a strong impact on attitudes. However, the analysis does not find a significant interaction effect between perceived ease of use (PEOU) and autonomy on attitudes. The T statistic of 0.223 and the p-value of 0.824 indicate that the evidence is not strong enough to establish a significant interaction effect between these variables. This suggests that the relationship between PEOU and autonomy does not significantly influence attitudes. In regard with the moderating role of PEOU on the relationship between competence and attitudes, the analysis suggests that there is no significant interaction effect between PEOU and the relationship between competence and attitudes. The T statistic of 0.712 and the p-value of 0.476 suggest that the evidence is not strong enough to establish a significant interaction effect between these variables. This implies that the relationship between PEOU and competence does not significantly impact attitudes. In addition, the analysis suggests no significant interaction effect between PEOU and relatedness – attitudes relationship. The T statistic of 1.055 and the p-value of 0.291 suggest that the evidence is not strong enough to establish a significant interaction effect between these variables. This implies that the relationship between PEOU and relatedness does not significantly impact attitudes. Moreover, the analysis suggests that no significant interaction effect between PU and relatedness – attitudes relationship. The T statistic of 0.098 and the p-value of 0.922 suggest that the evidence is not strong enough to establish a significant interaction effect between these variables. This implies that the relationship between PU and relatedness does not significantly impact attitudes. In regards

with the moderating influence of PU in the relationship between relatedness and attitudes, the analysis suggests that there is no significant interaction effect between PU and competence – attitudes relationship. The T statistic of 0.306 and the p-value of 0.760 suggest that the evidence is not strong enough to establish a significant interaction effect between these variables. This implies that the relationship between PU and competence does not significantly impact attitudes. Moreover, the analysis indicated that there is no significant interaction effect between PU and autonomy on attitudes. The T statistic of 0.917 and the p-value of 0.359 suggest that the evidence is not strong enough to establish a significant interaction effect between these variables. This implies that the relationship between PU and autonomy does not significantly impact attitudes. In regards with the mediating influence of subjective norm on the relationship between relatedness and attitudes, results indicated that learners who perceive a higher level of relatedness in their eLearning experiences also tend to influenced by others opinion and this effects their attitudes towards eLearning positively. The T value of 2.487 and the p-value of 0.013 suggest a significant positive mediating effects of SN on the relationship between relatedness, and attitudes. Moreover, the potential mediating effect of SN on the relationship between autonomy and attitudes. Results indicated that the p-value of 0.004 which indicate a significant positive mediating effect of subjective norm on the relationship between autonomy and attitudes. In regards with the mediating effect of SN on the relationship between competence and attitudes. The T value of 0.714 and the p-value of 0.475 suggest that there is not enough evidence to establish a significant relationship between competence, SN, and attitudes.

Implications

The findings of this research can be valuable for policymakers in the integration of e-learning in Saudi Arabia's education system. They can also inform curriculum developers and educators in designing e-learning courses that are tailored to the needs and preferences of Saudi female learners. Understanding the factors that influence their attitudes towards e-learning can help in creating engaging and interactive features, and ensuring flexibility to accommodate the unique circumstances and responsibilities of Saudi female learners. The research also highlights the importance of focusing on making e-learning experience ease and enhance the competence of the learner as these will influence their attitudes. The study emphasizes the significance of PEOU and PU of e-learning. educational institutions can use the research findings to identify gaps in technology infrastructure and take measures to bridge these gaps. This may involve ensuring reliable internet connectivity, providing necessary hardware and software resources, and addressing any technological barriers that negatively influence Saudi females' PEOU of e-learning. The research sheds light on the influence of social and cultural factors on Saudi females' attitudes towards e-learning. The findings contribute to the existing body of knowledge by emphasizing the importance of understanding subjective norms in females eLearning adoption decision. This understanding can help educators in designing culturally sensitive educational interventions and addressing potential barriers that may arise due to social and cultural factors. The study identifies self-efficacy and motivation as key factors influencing Saudi females' attitudes towards e-learning. This highlights the significance of fostering self-confidence and motivation among learners to engage in online education effectively. Researchers and educators can explore interventions and strategies that enhance learners' self-efficacy beliefs and motivation in the e-learning context. Understanding the role of these psychological factors can contribute to the development of effective e-learning interventions and support systems. Moreover, the research provides insights into factors that influence Saudi females' acceptance of technology in the educational context. By examining variables such as PU and PEOU. The findings can

inform future research on technology acceptance and adoption in the Saudi Arabian context and guide the development of theoretical frameworks and models that explain learners' attitudes towards e-learning technologies. In summary, the practical and theoretical implications of this research contribute to the advancement of e-learning practices and policies in Saudi Arabia, promoting inclusivity, and providing valuable insights for educators, policymakers, and researchers in improving the quality and accessibility of continuing education for Saudi females.

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