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Investigating Determinants of the Acceptance of Zoom Technology Through the Lens of GETAMEL

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Abstract: The present study aims to determine factors influencing graduate students' intention to use Zoom technology. A questionnaire modified to conform to the General Extended Technology Acceptance Model was distributed to 256 graduate students at King Khalid University in Saudi Arabia. The results indicate that the hypothesized model was a good predictor of intention to use. About 71% of the variance of intention to use Zoom technology was explained. The model's antecedents significantly predicted intention to use. The most crucial factor was attitude, while perceived usefulness had a negligible impact on predicting intention to use. Both perceived ease of use and perceived usefulness were found to predict students' attitudes towards using Zoom. Self-efficacy and enjoyment were the most fundamental external factors in predicting perceived usefulness, but subjective norms had no significant effect. The best predictor of students' perceptions of the usefulness of the Zoom technology was perceived ease of use, followed by self-efficacy. Finally, perceived ease of use was significantly predicted by self-efficacy. The findings improve understanding regarding the acceptance of Zoom. This work is of particular interest to researchers, developers, and practitioners of Zoom in educational contexts.

Keywords: zoom technology, graduate students' intention, COVID-19, GETAMEL, TAM

دراسة محددات قبول تقنية Zoom في ضوء أنموذج قبول التكنولوجيا العام الموسع للتعلم الإلكتروني GETAMEL

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الملخص: هدفت هذه الدراسة إلى استقصاء المحددات في قبول تقنية Zoom بناءً على أنموذج قبول التكنولوجيا العام الموسع للتعلم الإلكتروني (GETAMEL). تم تحليل البيانات المستقاة من دراسة استقصائية واسعة النطاق شملت (256) طالبا من طلبة الدراسات العليا في جامعة الملك خالد في المملكة العربية السعودية تم توظيفهم من خلال أخذ عينات ملائمة عبر الإنترنت من خلال نمذجة المعادلات الهيكلية. تم تحليل مجموعة البيانات باستخدام برنامج SPSS. وكشفت النتائج أن أنموذج الدراسة المستخدم يتمتع بقدرة تفسيرية عالية حيث يقوم بتفسير (71%) من التباين في النوايا السلوكية لاستخدام تقنية الـ Zoom. والعامل الأكثر أهمية هو الاتجاه نحو الاستخدام، في حين أن الفائدة المتصورة كان لها تأثير ضئيل على التنبؤ بنية الاستخدام. وأن كلا من سهولة الاستخدام والفائدة المدركة كان لهما تأثير إيجابي على الاتجاهات نحو استخدام تقنية Zoom. وكان العاملان الخارجيان الأساسيان الكفاءة الذاتية والمتعة المدركة لهما تأثير إيجابي على الفائدة المدركة، لكن المعايير الذاتية لم يكن لها تأثير كبير. واظهر التحليل ان متغير سهولة الاستخدام هو أفضل مؤشر على تصورات الطلبة للفائدة المدركة لتقنية الـ Zoom، يليه الكفاءة الذاتية. وأخيرا، تم التنبؤ بسهولة الاستخدام المدركة بشكل كبير من خلال الكفاءة الذاتية. وتعزز نتائج الدراسة الفهم فيما يتعلق بقبول تقنية الـ Zoom. ولهذه النتيجة أهمية خاصة للباحثين، والمطورين، والممارسين لتقنية Zoom في البيئات التعليمية.

الكلمات المفتاحية: تقنية Zoom، النوايا السلوكية لطلاب الدراسات العليا، COVID-19، GETAMEL، TAM

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Introduction

The outbreak of COVID-19 first detected in Wuhan, China, in December 2019 soon became a pandemic that changed lives throughout the world in 2020. The spread of the disease challenged education systems globally by forcing universities and other educational institutions to move from face-to-face lectures and classes to remote virtual learning (Serhan, 2020). Social distancing was introduced, so schools and workplaces were shut down and students were unable to continue their education in the usual way. Many institutions made heavy use of technologies such as Zoom to allow education to proceed without risking the spread of the novel coronavirus. Business of Apps (2021) reported an increase of 67% in Zoom usage between January and mid-March 2020, as the pandemic took hold. Jordannovet (2020) calculated that the platform had by late February 2020 gained 2.22 million users for every day of that year. There was considerable growth in interest among educational institutions in using Zoom to support learning and teaching. Business of Apps (2021) states that during the pandemic, Zoom was used as a remote teaching tool "by 90,000 schools in 20 countries".

According to Reimers et al. (2020), supporting the safe continuation of education was an important priority in every country at this challenging time; therefore, many educational institutions worldwide shifted all of their academic programs online and begun using electronic teaching approaches including virtual conferencing via Microsoft Teams, Zoom, Skype, Line, Google Meet, WhatsApp, Telegram, and other platforms. A review of the literature identifies many purported benefits of using these platforms in the educational field, including improving relationships and the flexibility of learning collaboration by using laptops, tablets, computers, or smartphones to conduct conferences (Bawanti & Arifani, 2021; Krakower & Blumengarten, 2020).

Zoom, which was released in August 2012, has been ranked as one of the most popular emerging videoconferencing platforms (Lenkaitis et al., 2019). It can be used to connect students to their teachers without physical contact and is described by Reimers et al. (2020) as an easy and reliable service cloud computing-based video and audio platform for conferencing, chat, and webinars. Participants do not need an individual account to join a meeting and can access the software via web-based, iOS, and Android devices. Nash (2020) characterizes Zoom as among the most powerful digital platforms. Its key features include file sharing, group messaging, collaboration workspace, and on-demand recording. The technology, which can be integrated with third-party apps such as Canvas LMS, Course Web (Blackboard), and G Suite, allows virtual conferences, online lectures, meetings, and webinars to be conducted at low financial cost, making Zoom appropriate as a medium of cooperation among students without the constraints of distance and time associated with physical meetings (Wan Hassan et al., 2020). According to Bawanti and Arifani (2021), studies conducted in recent years have confirmed its potential for allowing teachers and students free rein when it comes to their teaching-learning process without constraints of space or time, while Mpungose (2021) found this to be a technology that facilitates effective and synchronous e-learning.

Saudi Arabia's education system, in common with others globally, was considerably disrupted by the COVID-19 pandemic, as higher education institutions (HEIs) required lecturers move their services online and to use video conferencing platforms to supplement learning management systems for e-learning.

While Zoom, in common with other commercially available conferencing tools, has a recording feature allowing playback of lectures and other materials as required and notwithstanding the claims alluded to above that the use of this platform enhances the efficiency of remote teaching and learning, the use of Zoom in educational contexts is at an early stage of development. Its successful implementation would appear to be critically reliant on its acceptance by users including students, who can be identified as key stakeholders in the effective integration of any new technology into learning practices and whose perceptions will influence its use.

The current study seeks to fill an important gap in the literature by determining the variables that influence the acceptance of the Zoom platform among graduate students in Saudi Arabia, using the general extended technology acceptance model (GETAMEL) of Abdullah & Ward (2016) as its theoretical framework to answer the following research questions:

1) To what extent does the proposed research model explain graduate students' intention to Zoom platform?

2) What factors influence the adoption and use of the Zoom platform by graduate students at King Khalid University in Saudi Arabia?

Literature review and model development

The rapid technological advancements and the digitalization in almost all areas of our lives, including education, have turned the attention of researchers and academics to the variables that explain an individual's acceptance of technology. This attention has resulted in many intention-based theories and models being proposed and empirically examined in the last decade, with the aim of identifying, explaining, and predicting the dynamics of technology adoption and use. These include the theory of reasoned action (TRA; Fishbein & Ajzen, 1975; Ajzen & Fishbein, 1980) and its extension, the theory of planned behavior (TPB; Ajzen, 1985, 1991), the task-technology fit model (Goodhue & Thompson, 1995), social cognitive theory (Bandura, 1986, 1997), the unified theory of acceptance and use of technology (Venkatesh et al., 2003), the motivational model, the model of PC utilization (Thompson et al., 1991), the technology acceptance model (TAM; Davis, 1989), the combined TAM and TPB (Taylor & Todd,1995), innovation diffusion theory (Rogers, 1983), and GETAMEL (Abdullah & Ward, 2016). In recent decades, there has been growing body of empirical work on these theories and models, but it has produced abundant contradictory results on their generalizability and comparability (Scherer et al., 2019).

One of the most fundamental and robust models claiming to describe or explain the individual adoption of technological innovations is TAM (Davis, 1989), based on the earlier TRA (Fishbein & Ajzen, 1975). In the three decades since its inception, TAM has become the model most frequently invoked to explain and predict technology usage (Sánchez-Prieto et al., 2019; Scherer & Teo, 2019) and it has been extended to incorporate additional external variables (Granić & Marangunić, 2019). In particular, TAM has been extensively used to test the acceptance of e-learning technologies and is widely considered to have proved its relative effectiveness, robustness, simplicity, and applicability in explaining and predicting the attributes that affect users' adoption behavior towards new technologies.

TAM, incorporating the concepts of perceived usefulness (PU) and perceived ease of use (PEoU), constitutes a general theory for studying the acceptance of new technology in the educational field (Eraslan Yalcin & Kutlu, 2019; Sánchez-Prieto et al., 2019). PU and PEoU have been proven to be antecedent variables influencing the acceptance of learning with technology (Granić, & Marangunić, 2019), findings that can also be applied to the field of education (Scherer et al., 2019). These variables are in turn affected by external variables that influence attitudes towards technology adoption (Chang et al., 2017). Later versions of the model (see Figure 1) incorporate these external variables to explain variations in PU and PeoU, as well as three dependent variables: attitude toward use (ATT), behavioral intention to use (IU), and actual use (Eraslan Yalcin & Kutlu, 2019; Sánchez-Prieto et al., 2019).

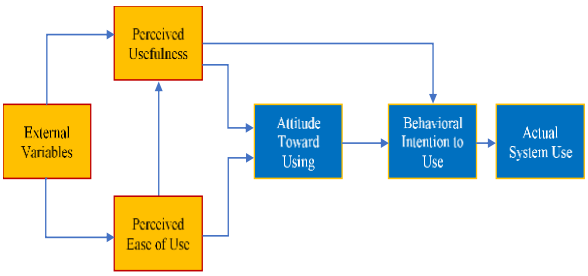


Figure 1. The technology acceptance model, redrawn from Davis et al. (1989, p.985)

Despite its widespread influence on research, applications of TAM have remained limited. A weakness of the original model is its exclusion of any external variables which may affect users' intention to use technology and whose incorporation has been found to enhance the model's predictive validity (Huang et al., 2019). For this reason, scholars and researchers have modified Davis's (1989) model by adding external variables posited to influence the main variables, PU and PEoU (Granić & Marangunić, 2019). Based on a comprehensive meta-analysis of 107 studies, classifying the most frequently invoked of such external variables, Abdullah and Ward (2016) proposed an integrated model, GETAMEL, illustrated in Figure 2. This incorporates the five constructs most often reported in their review of prior research, excluding some constructs that had nonetheless been influential elsewhere. Their analysis found that self-efficacy (SE), subjective norm (SN), enjoyment (ENJ), anxiety (ANX), and computer experience (EXP) each had significant effects on students' acceptance of e-learning. According to Abdullah and Ward (2016), PEoU was most strongly affected by SE and PU by ENJ. The credibility of the external variables established in GETAMEL has been validated in meta-analyses (e.g., Baki et al., 2018) and empirical studies (e.g., Chang et al., 2017; Revythi & Tselios, 2019). The overall model was validated by Abdullah et al. (2016), who determined the behavioral intention of

students to use e-portfolios. Consequently, this study adopts GETAMEL as a baseline model in addition to the original TAM.

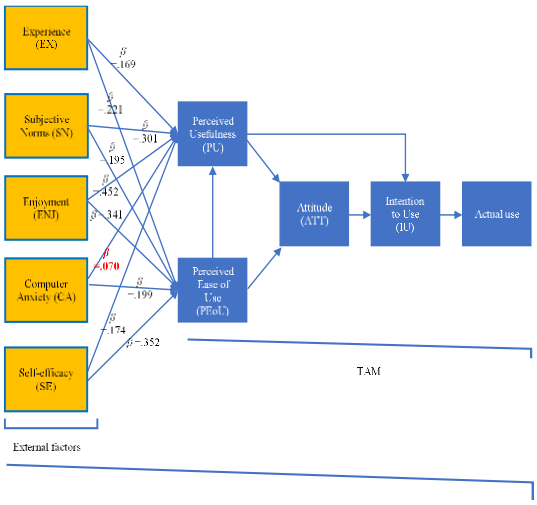


Figure 2. GETAMEL, with average path coefficients (β) between the five most commonly used external variables and students' perceived ease of use and perceived usefulness of e-learning systems (Abdullah and Ward, 2016, p.246).

Research hypotheses

While the model used in the present study is based on the theoretical foundation of GETAMEL, it omits consideration of actual use, as few participants were expected to have experience of using the Zoom platform in learning, a practice still in its infancy. The ultimate dependent variable was thus taken to be their intention to use Zoom.

Figure 3 represents the model to be tested and analyzed. A general structural model was developed, based on the previous studies, and incorporating four of the external variables from GETAMEL (Abdullah & Ward, 2016), namely EXP, SN, ENJ, and SE, while retaining the four predictive domains of TAM (Davis, 1989): PU, PEoU, ATT, and IU. These foundational models agree that PEoU is the predictor of PU, that both PU and PEoU directly predict ATT, that PU directly predicts IU, and that PU and ATT directly predict IU, while PEoU predicts IU indirectly through ATT.

GETAMEL external constructs

According to Abdullah and Ward (2016), EXP, SN, ENJ, and SE will all directly influence PEoU and PU. In the context of Zoom technology, a study by Alfadda and Mahdi (2021) found that these two primary constructs of TAM had a substantial effect on the acceptance of the platform and were positively correlated with SE.

Abdullah and Ward (2016) report that these external constructs were tested in several empirical studies, which validated the results. These include PEoU being positively influenced by SN (Doleck et al., 2018; Ibili et al., 2019), by EXP (Hajiyev, 2018; Kimathi & Zhang, 2019), by SE (Hanif et al., 2019; Huang et al., 2020), and by ENJ (Doleck et al., 2018; Huang et al., 2020). In addition, PU was found to be positively influenced by SN (Vanduhe et al., 2020), by EXP (Chang et al., 2017; Hajiyev, 2018), by SE (Hajiyev, 2018), by ENJ (Doleck et al., 2018; Hanif et al., 2019), and by PEoU (Ibili et al., 2019; (Vanduhe et al., 2020). More specifically, Chang et al. (2017) found that SN, EXP, and ENJ influenced the acceptance of e-learning.

EXP is a factor that affects the perception of technology and the incorporation of Zoom into teaching practices. It is considered one of the most important external factors influencing technology acceptance. In the context of the original TAM and GETAMEL models, EXP is referred to as the amount and type of skills that a user steadily gains. It has been identified as the best-known external variable for TAM (Davis, 1989) in the context of predicting e-learning acceptance (Abdullah & Ward, 2016). Previous studies have found that EXP affects both PEoU and PU (Abdullah & Ward, 2016; De Smet et al., 2012). Individuals with experience of using the Internet, computers, and email tend to have more favorable perceptions of both the ease of use and the usability of e-learning (Lee et al., 2013).

A number of researchers have reported that users' acceptance of information and communication technologies is influenced by their subjective norms. Although Davis et al. (1989) did not consider SN when constructing the initial version of TAM, they did recommend that its contribution should be examined in future studies. Ursavaş et al. (2019) called for a renewed focus on SN, defined as "an individual's perceptions regarding the approval or disapproval of important others of a target behavior" (p. 2503), to better understand the intention to use technology. Since SN was included in subsequent iterations of TAM and in GETAMEL, the current study investigated its influence on PU and PEoU. The influence of this predicter on both PU and IU was confirmed in earlier studies (Abdullah & Ward, 2016; Chang et al., 2017;

Kimathi & Zhang, 2019; Rizun & Strzelecki, 2020; Sánchez-Prieto et al., 2019).

Matarirano et al. (2021) used GETAMEL to examine the effects of pre-identified factors on the adoption of Blackboard LMS by lecturers at an HEI in South Africa, finding that ATT was influenced by PU but had no significant effect on IU. They also report that PEoU was significantly influenced by SE and ENJ. An earlier study of ICT users by Isiyaku (2018) found that SE and ENJ influenced PU significantly, but it did not support the hypothesis that SN significantly influenced the PU of ICTs.

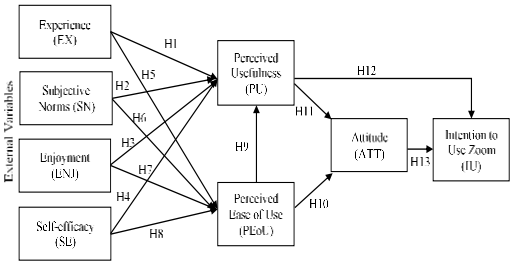


Figure 3. Research model

One of the factors most often studied for its influence on PU and PEoU is enjoyment. Venkatesh (2000) defines ENJ as "the extent to which the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use" (p. 351). The effect of ENJ on system use has been confirmed in previous studies (Sánchez-Prieto et al., 2019; Chang et al., 2017; Tsai et al., 2018). Rizun and Strzelecki (2020) identify ENJ as the best predictor of student's acceptance of shifting education to distance learning, while Chang et al. (2017) posit that this construct is critical in explaining e-learning adoption. Various studies have found that ENJ produced a significant and positive influence on PU and PEoU (Abdullah & Ward, 2016; Chang et al., 2017; Kimathi & Zhang, 2019; Rizun & Strzelecki, 2020). Kimathi and Zhang (2019) state that SN positively influences PU and PEoU, EXP positively influences PEoU, and ENJ positively influences PEoU. When enjoyment of Zoom increases, the user's intention to use this technology also rises.

Venkatesh and Bala (2008) define computer self-efficacy as an individual's central beliefs regarding his/her ability to use a computer system. Among the factors established in GETAMEL, SE has been shown to influence positively the PEoU and PU of technology (Abdullah & Ward, 2016; Gbongli et al., 2019). Teo et al. (2019) used SE as a predictor of the PEoU of Web 2.0 technology, finding that participants' SE levels did indeed influence these perceptions, while Şahin et al. (2021) report that SE and ENJ positively affected instructors' intention to use information technologies in higher education. Finally, Ifinedo (2017) found that participants' SE had a positive effect on the PEoU of blogs ($\beta = 0.35$, $p < 0.01$).

In accordance with the above previous findings regarding external factors, the following hypotheses were formulated:

- Hypothesis 1: EXP will have a significant influence on PU.
- Hypothesis 2: SN will have a significant influence on PU.
- Hypothesis 3: ENJ will have a significant influence on PU.
- Hypothesis 4: SE will have a significant influence on PU.
- Hypothesis 5: EXP will have a significant influence on PEoU.
- Hypothesis 6: SN will have a significant influence on PEoU.
- Hypothesis 7: ENJ will have a significant influence on PEoU.
- Hypothesis 8: SE will have a significant influence on PEoU.

TAM Constructs

The TAM as originally developed comprises four constructs, namely PEoU, PU, ATT, and IU (Davis, 1989; Davis et al., 1989). The model posits that intention to use is determined by attitude, which in turn is influenced by perceived usefulness and perceived ease of use. According to Davis (1989), the most crucial element affecting a user's decision to accept or reject a particular technology is PU, meaning "the degree to which a person believes that using a particular system would enhance his or her job performance" (p.320). In the Zoom technology context, PU refers to the extent to which a user believes that the platform can be a driving force towards improving academic performance and achieving educational objectives. On a more specific basis, users tend to use or not use Zoom based on the extent that they believe it will enhance their learning performance. Abdullah et al. (2016) have demonstrated that PU and PEoU significantly affect students' attitudes to using technologies. The findings of Rizun and Strzelecki (2020) indicate that both PU and PEoU predict students' ATT and IU

regarding distance learning. Similar findings are presented by Unal and Uzun (2020), who conducted a study to determine factors influencing students' behavioral intention to use the Edmodo network. ATT was identified as the most crucial factor, while PU had a moderate impact on intention. PEoU predicted PU directly and influenced IU indirectly through ATT.

PEoU, defined as "the degree to which a person believes that using a particular system would be free of physical and mental effort" (Davis, 1989, p. 320), has been used extensively to examine user acceptance of technologies. Researchers have found that PEoU significantly and positively affected ATT when users regarded a given technology as easy to use (Abdullah & Ward, 2016; Gbongli et al., 2019; Granić & Marangunić, 2019; Scherer et al., 2019), whereas others found no support for the significance of this relation (Doleck et al., 2018; Matarirano et al., 2021). A study of teachers' adoption of open educational resources (OER) by Tang et al. (2020) concluded that PEoU determined PU, ATT, and IU, while PU was a significant predictor of their ATT and IU.

ATT, defined as the degree to which a user prefers a particular technology (Fishbein & Ajzen, 1975), has been verified as a mediating variable connecting PE and PU with students' intention to adopt Zoom. It is composed of individuals' values and beliefs and measures their positive or negative feelings about accepting the technology (Sánchez-Prieto et al., 2019). The present study defines ATT as students' positive or negative feelings toward using Zoom technology.

The literature reports research stating that the PU and PEoU of digital technologies positively influence a person's attitude to using and accepting them (Abdullah & Ward, 2016; Scherer et al., 2019). As noted above, Tang et al. (2020) found that both PEoU and PU significantly determined ATT toward OER. Meta-analytical reviews have confirmed that PU and PEoU primarily determine users' intention to accept diverse learning technologies (Granić & Marangunić, 2019; Scherer et al., 2019). Granić and Marangunić (2019) assert that PU has a stronger effect than PEoU on IU, while Scherer et al. (2019) identify ATT as a mediator between PEoU/PU and IU in this context.

Sánchez-Prieto et al. (2019) state further that ATT is the main predictor of IU, which denotes the degree to which a user is willing to use a particular technology (Fishbein & Azjen, 1975). Many GETAMEL studies have found a positive and significant relationship between ATT and IU (Abdullah & Ward, 2016), whereas others report finding no support for the significance of this relation (Doleck et al., 2018; Matarirano et al., 2021).

Based on the above discussions, the following hypotheses are proposed in the context of Zoom technology:

- Hypothesis 9: PEoU will have a significant influence on PU.
- Hypothesis 10: PEoU will have a significant influence on ATT.
- Hypothesis 11: PU will have a significant influence on ATT.
- Hypothesis 12: PU will have a significant influence on IU.
- Hypothesis 13: ATT will have a significant influence on IU.

Methodology

Participants

The study was conducted at King Khalid University (KKU) in Abha, Saudi Arabia, during the 2020-2021 academic year. The target population consisted of 513 graduate students at KKU, who were invited to complete an online survey. Among the 302 who agreed to participate, a total of 256 completed the survey, a response rate of 84.6%. Of these 256 participants, 59% (n = 151) were male and 41% (n = 105) were female. Around 53% (n = 134) had used the Zoom platform for learning purposes, while 93% (n = 239) had more than ten years of computer experience and spent about 4 to 6 hours every day on the Internet.

Data collection tool and procedure

The self-administered web-based survey instrument was divided into two sections, the first of which elicited demographic attributes such as gender, age, and experience of using handheld devices to access the Internet. The second section included items intended to ascertain the perceptions of participants regarding their behavioral intentions to use Zoom technology. Table 1 represents the measurement scales (items, reliability, and sources).

The quantitative data collected were used to test the research model. To ensure content validity, the scales for PU, PEoU, ATT, and IU were adapted from the specialized literature on the subject (Abdullah et al., 2016, Davis, 1989; Venkatesh & Bala, 2008), while those for EXP, SN, ENJ, and SE were adapted from published studies (Abdullah et al., 2016; Doleck et al., 2018; Matarirano et al., 2021), using a five-point

rating scale (1 = strongly disagree to 5 = strongly agree). Items were rewritten and modified as necessary to fit the context of this study. The instrument was translated into Arabic and the items were modified to make them relevant to the Zoom technology context. There was no incentive for participation in the survey.

The instrument's content validity was established by consulting a group of experts and specialists in the field of educational technology, who were asked to review it and found it to be satisfactory. Meanwhile, a pilot survey was conducted to establish its reliability. Content validity was further checked by pilot testing the instrument with 25 graduate students in the educational technology department at KKU.

Composite reliability for all factors in the measurement model was above 0.96. No construct was found to have an alpha value below the threshold of 0.7, as suggested by Hair et al. (2013). The Statistical Package for the Social Sciences was used to conduct reliability analysis, descriptive analysis, and regression analysis. Assumptions regarding the multiple regression analysis were checked graphically before the analysis results and research results and found not to be violated, confirming acceptability in terms of linearity, normality, multicollinearity, independence of residuals, and lack of outliers.

Results

Table 2 presents the correlations among the eight latent constructs. All correlations were statistically significant at the 0.001 level. The correlations among the latent constructs ranged from .374 to .834; therefore, no multicollinearity was found among the constructs.

Table 1. Measurement scales (Items, reliability, and sources)

Variables	Cronbach's alpha	N of items	Reference/Adapted from
EXP	0.754	3	Abdullah and Ward (2016); Rizun and Strzelecki (2020)
SN	0.872	3	Abdullah and Ward (2016)
ENJ	0.877	3	Abdullah, Ward, and Ahmed (2016); Venkatesh and Bala (2008)
SE	0.870	5	Abdullah, Ward, and Ahmed (2016); Liaw et al. (2007)
PU	0.910	4	Davis (1989); Ngai et al. (2007)
PEoU	0.879	4	Davis (1989); Ngai et al. (2007)
ATT	0.919	4	Davis (1989); Ngai et al. (2007)
IU	0.949	3	Abdullah and Ward (2016); Davis (1989); Ngai et al. (2007)
All variables	0.957	32	

Note. EXP, Experience; SN, Subjective norms; ENJ, enjoyment; SE, Self-efficacy; PU, Perceived usefulness; PEoU, Perceived ease of use AT, User's attitude; IU, intention to use.

Table 2. Correlations among the eight latent constructs

Construct	EXP	SN	ENJ	SE	PU	PEoU	ATT	IU
EXP	1							
SN	**0**.374**	1						
ENJ	**0**.500**	**0**.374**	1					
SE	**0**.526**	**0**.374**	**0**.404**	1				
PU	**0**.485**	**0**.345**	**0**.541**	**0**.559**	1			
PEoU	**0**.495**	**0**.353**	**0**.424**	**0**.620**	**0**.732**	1		
ATT	**0**.404**	**0**.271**	**0**.437**	**0**.489**	**0**.742**	**0**.659**	1	
IU	0.357**	0.300**	0.369**	0.396**	0.704**	0.581**	0.834**	1

Descriptive statistics

The means and standard deviations for all constructs were determined and are displayed in Table 3. The highest mean of 4.484 was for EXP, indicating that participants had strong experience in using the technology. The means for enjoyment, self-efficacy and

subjective norms were 4.30, 4.20, and 4.04 respectively. Those for attitude, perceived ease of use, and usefulness were 4.42, 4.32, and 4.31 respectively, while the mean for intention to use was 4.4180.

Table 3. Descriptive Statistics

Construct (# Items)	Mean	Std. Deviation
EXP (3 items)	4.4844	0.55206
SN (3 items)	4.0365	0.77176
ENJ (3 items)	4.2982	0.69174
SE (5 items)	4.1953	0.67723
PU (5 items)	4.3133	0.70192
PEoU (5 items)	4.3219	0.60312
ATT (4 items)	4.4248	0.71603
IU (4 items)	4.4180	0.75252

*Note***.** EXP, Experience; SN, Subjective norms; ENJ, Enjoyment; SE, Self-efficacy; PU, Perceived usefulness; PEoU, Perceived ease of use; ATT, User's attitude; IU, Intention to use

Hypothesis Testing

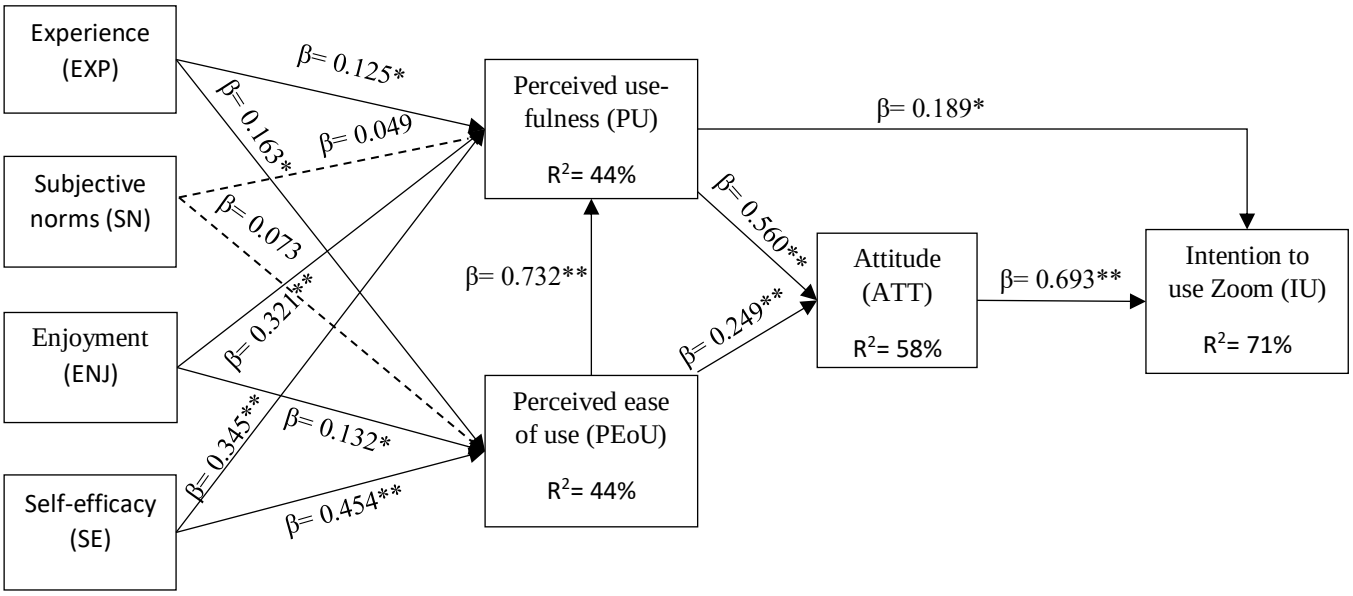
Table 4 lists the results of regression analysis based on the relationships proposed in the research model, while Figure 4 is a graphical depiction of the analysis results. The first regression analysis, with PU as the dependent variable and EXP, SN, ENJ, and SE as independent variables, showed that SE, EXP, and ENJ were significant predictor variables, whereas SN was not. The regression results indicate that taken as a set, the three constructs (EXP, ENJ, and SE) accounted for 44% of the variance in PU ($R2 = .0.444$, $F = 50.145$, $p < .001$). SE ($\beta = .345$, $t = 6.012$, $p < .001$) was found to have the greatest influence on PU, followed by ENJ ($\beta = .321$, $t = 5.690$, $p < .001$) and EXP ($\beta = .125$, $t = 2.072$, $p < .05$), which in turn supports hypotheses H1, H3, and H4. As there was no significant effect of SN on PU ($\beta = 0.049$), H2 was unsupported.

The second regression analysis, with PEoU as the dependent variable and EXP, SN, ENJ, and SE as independent variables, showed that SE, EXP, and ENJ were significant predictor variables. The model's R2 value indicated a large effect size at 0.44 and taken as a set, the four predictors (EXP, SN, ENJ, and SE) accounted for 44% of the variance in the PEoU of Zoom technology. As to the determinants of PEoU, the strongest was SE ($\beta = 0.454$, $t = 7.901$, $p < 0.001$), followed by EXP ($\beta = 0.163$, $t = 2.704$, $p < 0.001$), and ENJ ($\beta = 0.132$, $t = 2.337$, $p < 0.05$), supporting hypotheses H5, H7, and H8. However, as SN had no significant effect on PEoU ($\beta = 0.073$), H6 was not supported.

Table 4. Results of hypothesis testing

Hypothesis	Relationship	β	t	Sig.	F	R2	Durbin-Watson	Supported?
H1	EXP → PU	0.125	2.072	*0.039	50.145	0.444	1.779	Yes
H2	SN → PU	0.049	0.920	0.358				No
H3	ENJ → PU	0.321	5.690	**0.000				Yes
H4	SE → PU	0.345	6.012	**0.000				Yes
H5	EXP → PEoU	0.163	2.704	*0.007	50.042	0.444	1.977	Yes
H6	SN → PEoU	0.073	1.369	0.172				No
H7	ENJ → PEoU	0.132	2.337	*0.020				Yes
H8	SE → PEoU	0.454	7.901	**0.000				Yes
H9	PEoU → PU	0.732	17.126	**0.000	293.286	0.536	1.664	Yes
H10	PEoU → ATT	0.249	4.156	**0.000	174.444	0.580	1.922	Yes
H11	PU → ATT	0.560	9.364	**0.000				Yes
H12	PU → IU	0.189	3.748	**0.000	311.259	0.711	1.979	Yes
H13	ATT → IU	0.693	13.748	**0.000				Yes

*Note***.** EXP, Experience; SN, Subjective norms; ENJ, Enjoyment; SE, Self-efficacy; PU, Perceived usefulness; PEoU, Perceived ease of use ATT, User's attitude; IU, Intention to use



Note. ** p < 0.001; *p < 0.05

Figure 4. Path test of the research model

The results revealed that PEoU (β = 0.732, t = 17.126, p < 0.001) significantly accounted for 54% of the variance in PU (R2 = .536, F = 293.286, p < .001). Thus, H9 was supported. The R2 value of 0.580 indicates a large effect size and taken as a set, the two predictors (PEoU and PU) accounted for 58% of the variance in ATT, the major determinant being PU (β = 0. 560, t = 9.364, p < 0.001), followed by PEoU (β = 0.249, t =4.156, p < 0.001), which in turn supports hypotheses H10 and H11. The R2 value of 0.580 again indicates a large effect size and taken as a set, the two predictors (ATT and PU) accounted for 71% of the variance in ATT. As to IU, the major determinant was ATT (β = 0. 693, t = 13.748, p < 0.001), followed by PU (β = 0.189, t = 3.748, p < 0.001), which in turn supports hypotheses H12 and H13.

Discussion and Conclusions

The use of the Zoom platform in higher education is at an embryonic stage of implementation, especially in developing countries such as Saudi Arabia; therefore, in-depth research into aspects of this issue is worthwhile. While the literature reports several studies set in higher education and using the GETAMEL model (Abdullah & Ward, 2016), few have recruited graduate students in the Kingdom as users. The present study thus extends knowledge by using GETAMEL to examine factors influencing such students' intention to use Zoom technology in learning. Overall, the fit indices indicate that the hypothesized model is theoretically sound in predicting users' intention to use Zoom technology in Saudi Arabia. The model explains 71% of the variance of participants' intention to use. The results also demonstrate that the model constructs had both direct and indirect effects on their intention to use Zoom technology for educational purposes. Of the thirteen hypothesized relationships, eleven were supported.

Unlike previous GETAMEL studies conducted by Abdullah & Ward (2016), who found that enjoyment was the best predictor of students' perceptions of the usefulness of e-learning systems, the findings of the present study identify self-efficacy (β = 0.345) as a stronger predictor than enjoyment (β = 0.321). Consistent with past studies (e.g., Abdullah & Ward, 2016; Matarirano et al., 2021; Hanif et al., 2019; Huang et al., 2020), this study also ranks self-efficacy (β = 0.454) as the best predictor of participants' PEoU of Zoom, followed by experience (β = 0.163) and enjoyment (β = 0.132). This result supports the view that students with high self-efficacy for using Zoom technology will likely find it easy to use and readily accept it in their learning practice.

These relatively low beta values for the effects of EXP and ENJ on PEoU, as well as that of EXP on PU (β = 0.125), represent small effect sizes according to the guidelines proposed by Cohen (1992). A plausible explanation for these results, which are consistent with those of other studies (e.g., Doleck et al., 2018; Huang et al., 2020), is that participating students have had little experience using Zoom technology, reducing the likelihood of significant influence.

It was found that the graduate students' subjective norms were not a significant predictor of PU ($\beta = 0.049$, $p = 0.358$) or of PEoU ($\beta = 0.073$, $p = 0.172$), offering no support for the hypothesis that SN significantly influences the perceived usefulness of ICTs (Isiyaku et al., 2018). This finding is consistent with that of Chang et al. (2017) that SN had no significant impact on PEoU ($\beta = 0.025$, $p = 0.716$). Thus, there is no strong indication in the current study that peer pressure influences users' perceptions of the usefulness or ease of use of Zoom technology.

By contrast, PEoU was a strong predictor of PU, having the highest standardized path coefficient measure within the structured model ($\beta = 0.732$, $p < .001$), which is aligned with the findings of Abdullah et al. (2016), that PEoU was positively and significantly associated ($\beta = 0.602$, $p < 0.001$) with students' PU of an e-portfolio.

This study also validates PU as a significant predictor of students' attitude to Zoom ($\beta = 0.560$, $p < .001$), consistent with the work of Tang et al. (2020) and Matarirano et al. (2021), who found that PU had a statistically significant influence on ATT to the use of a learning management system ($\beta = 0.710$, $p < .001$).

Further, the present regression results show ATT to have a strong, positive, and direct relationship with students' intention to use Zoom technology, having the highest standardized path coefficient measure within the structured model of 0.693. This is in alignment with the research of Rizun and Strzelecki (2020), who found that ATT had the strongest effect (0.638) on IU, suggesting that it is essential to develop easy-to-use and user-friendly Zoom technology. Finally, the beta value for the relation between PU and IU was 0.189, a medium effect size according to the guidelines proposed by Cohen (1992).

The main theoretical contribution of this work is that it represents the first step in understanding graduate students' intention to adopt the Zoom platform in their learning. The findings offer researchers and practitioners new insights into what influences students' intention to use Zoom for educational purposes. However, the current study is subject to limitations that should be addressed in future research. First, it can be concluded that more studies are needed to investigate certain variables which were not tested in this study, and which may also influence intention to use Zoom technology, such as computer anxiety, motivation, and technical support. Finally, as the educational use of Zoom is still in its infancy, the current study did not incorporate actual use into the proposed model. This is not a serious limitation, as substantial empirical support exists for a causal link between intention and behavior. However, intention to use is only partially helpful, as its correlation with actual use is low and mediated by several other factors. Thus, continued study is needed to examine this more thoroughly by adding actual use into the model. In conclusion, replication studies and further research using experimental or qualitative methods such as in-depth interviews are needed to examine other variables of interest including computer anxiety.

Declarations

Abbreviations

GETAMEL, General Extended Technology Acceptance Model; EXP, Experience; SN, Subjective norm; ENJ, Enjoyment; SE, Self-efficacy; PU, Perceived usefulness; PEoU, Perceived ease of use; ATT, user's attitude; IU, Intention to use.

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