Students' intention to adopt e-government learning services: a developing country perspective

Al-Omairi, L., Al-Samarraie, H., Alzahrani, A. I. & Alalwan, N.

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Students' Intention to Adopt E-government Learning Services: A Developing Country Perspective

Abstract

Purpose: In any developing country, the critical benefits for ensuring proper utilization of egovernment learning services have basically emerged from the integration of underlying processes---not only across different levels of government, but also across different functions and agencies. The literature showed a notable lack of research to underline the limited use of egovernment learning services in a university setting. Therefore, this study was conducted to examine students' intention to adopt e-government learning services in a developing country. Precisely, the existent to which reputation, social influence, information quality and system quality of e-government learning services would influence students' trust, perceived usefulness, and perceived learning values was investigated. Methodology: The effect from these variables on students' intention to use e-government learning services was also investigated. A total of 406 questionnaires were collected and analyzed using Partial Least Squares (PLS) modeling. **Findings:** The results showed varying relationships between the study's variables. It is anticipated that understanding these relationships can predict future learning trends of egovernment learning services use among university students, thus helping decision makers plan ahead, prioritize tasks, and make better decisions. Value: Knowledge about students' intention to use e- government learning services is even useful for the implementation of other services by higher education institutions. This study also offers some implications for practitioners and researchers concerned about the application of e-government in students' learning development.

Keywords: distributed learning environments; informal learning; lifelong learning; improving classroom teaching; e-government services; technology adoption

1. Introduction

Fostering access to e-government learning services has been addressed by previous studies (e.g., Anderson, Wu, Cho, & Schroeder, 2015; Bataineh, Bataineh, Abu-Shanab, & Abu-Shanab, 2016; Lee & Porumbescu, 2019; Yang, Pardo, & Wu, 2014; Yusuf et al., 2020; Zhang, Xu, & Xiao, 2014) as a solution for the students to easily access learning resources. In the higher education of the developing world, e-government can provide the necessary means for students to access government services and information in a timely manner, which is believed to help advance the current practices of public administration (Zhang, Meng, Guo, Yin, & Luo, 2015). However, the use of e-government learning services in most developing countries is still progressing. In addition, there is a notable lack of research to underline the limited use of e-government in teaching university students. This scarcity may be attributed to the low popularity of e-government in teaching university subjects. Here, it is anticipated that understanding university students' adoption of e-government learning services in Oman (as a developing country) is essential for fulfilling the development efforts of higher education.

According to the Department of Economic and Social Affairs (2018), the UN Egovernment Survey reported that Oman's e-government development index was high in comparison to other countries in the region. This finding can be attributed to the fact that the majority of online users are between 18 and 35 years old, a segment of the population that mostly represents those with an educational background. The Sultanate of Oman has planned an e-Oman vision, as well as various government e-portals that were developed and maintained by technology experts (Al-Ruzaiqi & Baghdadi, 2016). One of the goals for ensuring effective utilization of e-government learning services in Oman is to develop systems that meet certain users' requirements and values (Sarrayrih & Sriram, 2015). Despite these efforts, the Sultanate of Oman still appears to lack evidence regarding the ways in which students currently perceive e-government learning initiatives. Moreover, the lack of understanding how certain factors can affect online users' adoption of electronic data is one of the main challenges of Oman's e-government concept (Al-Busaidy, Weerakkody, & Dwivedi, 2009). For example, ignoring relevant factors may results in a misidentification of improvements of services offered to people.

The governmental portal that offers different e-government initiatives in Oman (known as e-Oman) was launched in 2003 with the establishment of a government organization called 'Oman digital' (Al-Busaidy & Weerakkody, 2011). This portal was later developed to cover aspects of education and healthcare, presently known as 'Omanuna' (https://omanportal.gov.om). Omanuna was examined in this study in an attempt to understand students' use of e-government learning services in Oman. Omanuna provides services and resources to students at different levels of their study, particularly to impart information about the current policies of higher education, convey requests for training on specific learning matters, download learning materials (papers, theses, e-books, etc.) from the e-learning portal and provide information about other universities and their acceptance criteria. This study aims at answering a key question: 'What are the factors affecting students' intention to adopt e-government learning services in a university context?'. Understanding these factors will enable educational decision makers to set priorities in students' learning development by increasing their access to learning content, and make the learning process more creative, collaborative and challenging.

The literature review on Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) shows that many studies focus on the adoption intention of technologies in a certain context (e.g., Aldunate & Nussbaum, 2013; Sahin, 2006; Wang & Lai, 2014). Still, the use of these models is considerably effective for validating the measurement scales, but previous studies argued that UTAUT constructs may not necessarily predict actual behavior in a specific context (Ling, Ahmad, & Singh, 2016; Mallat, Rossi, Tuunainen, & Öörni, 2008; Rabaai, 2015; Rabaai, Zogheib, AlShatti, & AlJamal, 2017). Given that existing studies test the adoption of different technologies in different settings and with different models, a straight comparison of fixed factors is typically not possible because even with little knowledge made possible through factors, they are still best at describing groups' qualities needs and expectations. As "IT acceptance is conceptually and temporally distinct behavior" (Bhattacherjee & Lin, 2015, p. 364), it is anticipated that in an early stage of experience with the technology, other decision criteria are more relevant than in later stages of experience when shaping the intent to use the technology (Arts, Frambach, & Bijmolt, 2011; Premkumar & Bhattacherjee, 2008). This consideration led us to conduct a preliminary investigation in order to gain insights for shaping the present study's model. In the context of this study, e-government learning services refer to Omanuna portal as the main provider of these services in Oman. The outcomes from the preliminary study resulted in certain exogenous and endogenous constructs that were used to shape the research model of this study. The following section discusses the relationships between these constructs.

3. Research model

This section addresses the associations between the present study's variables supported by the previous evidences in a context-specific situation.

3.1 Reputation

The concept of reputation has been evaluated in the literature from many different perspectives. From a marketing point of view, the concept of reputation has often been associated with the idea of brand equity (Aaker, 1996) or the organization's credibility to its customers (Nguyen & Leblanc, 2001). Martin and Jonasson (2014) stated that the reputation of a website is influenced by individuals' opinion on the trustworthiness of the website's information, which is articulated through community ratings and experiences reports, and through the fulfilled actions. The relationship between website reputation and individuals' trust was defined by Olaleye (2016) as the degree to which a user shapes his/her positive reaction to the system based on their trust in its service and context. A study by Dijkmans, Kerkhof, and Beukeboom (2015) assessed how aspects related to website reputation to influence users' application of social media. Based on these observations, it is anticipated that e-government reputation will positively affect students' trust of the provided services, thus formulating the following hypothesis:

H₁ Reputation of e-government learning services has a significant influence on students' trust.

Few studies have analyzed the influence of reputation on individuals' perceived usefulness. For example, Issa, Issa, and Chang (2012) explained the effect of reputation on students' perceived usefulness to drive the use of the system. Previous studies, such as the work of Wu and Chen (2017) and Sa, Lee, Kang, Gim, and Kim (2016), have shown how perceived usefulness of the system can be significantly and positively influenced by the perceived reputation through social initiatives. In addition, measures taken by an organization would constitute a credible form of quality assurance for promoting its image among certain group of users (reputation) (Winch, 2001), which implies that users might strengthen their belief about the usefulness of the service if they find it to be of high quality (Issa et al., 2012). Thus, the following hypothesis is formulated:

 H_2 Reputation of e-government learning services has a significant influence on students' perceived usefulness.

A number of studies have justified the association between perceived reputation and perceived value among people in different settings. For example, some previous studies (e.g., Herbig, Milewicz, & Golden, 1994; Shane & Cable, 2002) have explained the role of organizational reputation (creditability) in shaping individuals' perceived value of a service. However, perceived reputation can be characterized as an unstable active that can be changed during the development of an organization (Park & Lee, 2009). Alkhattabi, Neagu, and Cullen (2010) suggested that reputation play a key role in promoting the contextual representation of knowledge, which can potentially influence the learning value of a person. This study suggests that the reputation of the e-government learning services influences students' learning value, thus the following hypotheses are suggested:

H₃ Reputation of e-government learning services has a significant influence on students' perceived learning value.

H₄Reputation has a significant influence on students' intention to use e-government learning services.

3.2 Social influence

Social influence is used to denote institutions and organizations, as well as organized or unorganized groups of individuals (Hogg, Terry, & White, 1995). The association between social influence and an individual's trust has been characterized as the degree to which the use of technology can fulfill certain group's needs (Cook, Cheshire, Rice, & Nakagawa, 2013). As such, perceived group norms become the reference point for beliefs, attitudes and behaviors as individuals seek to behave in a manner consistent with the relevant social group (Walsh, White, & Young, 2009). Furthermore, it is evident that certain groups of people are identified in terms of their relevant social norms that help shape the attitude and belief of a person (Hsu, 2009). Yet, there is not much work about how social influence is associated with students' trust when using the e-government learning services. Therefore, the following hypothesis is formed:

H₅ Social influence has a significant influence on students' trust toward e-government learning services.

Several studies (e.g., Calisir, Atahan, & Saracoglu, 2013; Karaali, Gumussoy, & Calisir, 2011; Terzis, Moridis, & Economides, 2012) have explored the significant association between social influence and perceived usefulness of an individual to use technology. The most notable one was conducted by Eckhardt, Laumer, and Weitzel (2009), who explained how social influence on adoption can be explained by both the source (peer groups) and sink (adopters and non-adopters) of the system which, as a result, increase the cumulative subjective norm. Therefore, it is reasonable to say that social influence may possibly influence students' experience with e-government, so the following hypothesis is proposed:

H₆ Social influence has a significant influence on students' perceived usefulness of egovernment learning services.

Previous studies explained that individuals in a context influenced by social interactions are more likely to shape their decisions based on these interaction (Epstude, 2017; Ling & Husain, 2013). When actors in social groups have a low level of inclusion, they will have little opportunity to modify the accepted technology, and their rejection of the technology will have little consequence (Bastiaensens et al., 2016). Keller, Bonk, and Hew (2005) found that the influence of social interaction on learning is more than just having the benefit of someone's encouragement. This is where individual's experience is sampled, either by oneself or in relevant social groups, mainly because they have common ends and purposes (Hoban & Erickson, 2004). Based on these observations, following hypothesis is proposed:

H₇ Social influence has a significant influence on students' perceived learning value of egovernment learning services.

The influence of social influence on individuals' intention to use a system has been the focus of most TAM studies, particularly UTAUT. The literature (e.g., Casey & Wilson-Evered, 2012; Karaali et al., 2011; Kijsanayotin, Pannarunothai, & Speedie, 2009; Yang, Moon, & Rowley, 2009) showed that the relationship between social values and individuals' behavior among their friends and family can positively contribute to their use of the technology. Building from these previous studies, this study considered proposing the following hypothesis:

H₈ Social influence has a significant impact on students' intention to use e-government learning services.

3.3 Information quality

Based on the definition of DeLone and McLean (1992), information quality refers to the level of information system output in terms of accuracy, relevance, timeliness, adaptability and accessibility. Priyadarshini et al. (2017) explained that information quality of a website can potentially influence the level of trust an individual develops toward a system. For example, when individuals perceive the provided information to be insufficient, their level of trust is more likely to decrease (Rains, 2008). Based on this, it is proposed that students' information quality perception of e-government learning services can potentially influence their trust, thus forming the following hypothesis:

H₉ Information quality has a significant influence on students' trust in e-government learning services.

According to Tan and Pan (2002), user experience will not be enhanced unless both information quality and perceived usefulness can effectively supplement each other. Within the e-government context, Chen and Zhang (2012) stated that information quality may play more prominent roles in the more complicated tasks required for e-participation. When the information provided to the users helps them to identify new cues, they are likely to experience improvement in the efficiency of decision-making (Kolekofski Jr & Heminger, 2003), thus perceiving the usefulness of the service. Based on these assertions, the following hypothesis is formed:

 H_{10} Information quality has a significant influence on students' perceived usefulness of egovernment learning services.

The association between the quality of information presented to a person and the learning value obtained from such information has been widely studied in the literature (Gallagher & Sixsmith, 2014a, 2014b; Radwan, Senousy, & Alaa El Din, 2014). For example, Ahmed (2010) and Chang (2015) argued that information quality can potentially play a key role in promoting individuals' learning process by providing the necessary elements for them to make better decisions related to certain government services. From these, it can be proposed that students' information quality perception of e-government learning services may be positively related to their learning value, thus shaping the following hypothesis:

 H_{11} Information quality has a significant influence on students' perceived learning value of egovernment learning services.

The effect of information quality on the intention to use technology has been shown to be significant in several previous studies where some studies exhibited a non-significant effect. Ramayah, Ahmad, and Lo (2010), for example, stated that information quality could drive one's intention to use online systems in an academic context. Chiu, Wang, Shih, and Fan (2011) and Almahamid, Al Kalaldeh, and Mo'taz (2010) revealed that the information quality of online systems may positively impact users' intention to adapt it. In addition, individuals' perception toward the quality of information may potentially increase the level of their engagement and subsequently increase the intention to use it in future (Poelmans, Wessa, Milis, Bloemen, & Doom, 2008; Qutaishat, 2012). Therefore, we considered the role of e-government's information quality in driving students' intention to use it. This led to the formation of the following hypothesis:

 H_{12} Information quality has a significant influence on students' intention to use e-government learning services.

3.4 System quality

The conceptual understanding of the DeLone and McLean model system (2003) leads us to define system quality as the reliability of the system in terms of online response time, ease of use, and accuracy. This definition has been widely linked to the concept of trust because previous studies claimed that certain technical aspects of the system may potentially influence users' willingness to trust the content and services (Vance, Elie-Dit-Cosaque, & Straub, 2008). For example, research conducted by McKnight, Cummings, and Chervany (1998) highlighted the major relationships, other than environmental measures, between the quality of an artifact and individuals' trusting beliefs. Based on these, the following hypothesis is developed:

 H_{13} System quality has a significant influence on students' trust in e-government learning services.

It is argued that when an individual perceives the system to provide the functionalities to perform a behavior, the user is more likely to perceive its usefulness, thus forming the intention to use it in the future (Islam, 2012; Kim, Lee, & Law, 2008; Polites, Williams, Karahanna, & Seligman, 2012; Shin, 2015). This is mainly because an increase in the quality of the system leads to an increase in decision-making (Bharati & Chaudhury, 2004). In the light of such evidence, we considered forming the following hypothesis:

H₁₄ System quality has a significant influence on students' perceived usefulness of egovernment learning services.

The association between system quality and individuals' learning value has been characterized by the way in which the technology is considered a fit to the task and learning needs. Few studies (e.g., Nelson, Todd, & Wixom, 2005; Udo, Bagchi, & Kirs, 2010) have wondered how an increase in positive perception about the system quality can potentially increase one's learning value across contexts. For example, Chen et al. (2012) asserted that the external influence of system quality and learning motivation on students' use of learning systems can be somehow relevant to the development of their intention to use technology. Therefore, the following hypothesis is proposed:

H₁₅ System quality has a positive influence on students' perceived learning value of egovernment learning services.

The literature within the information system field showed mixed support for the relationship between system quality and the intention to use a system at the individual level of analysis (Al-Debei, Jalal, & Al-Lozi, 2013). Still, system quality (e.g., reaction time, ease of use, user needs, accessibility, and reliability) could affect individuals' intention to use an information system (Delone & McLean, 2003; Liu & Roland Weistroffer, 2017). Some studies showed that system quality influenced online system intention (Halawi, McCarthy, & Aronson, 2008; Petter & McLean, 2009; Zheng, Zhao, & Stylianou, 2013). Particularly, Delone and McLean (2003) considered that both information quality and system quality can potentially influence individuals' intention to use a system. Due to the high association between system quality and users' intention to use online systems, the following hypothesis was developed:

 H_{16} System quality has a positive influence on students' intention to use e-government learning services.

3.5 Trust

Trust is defined as individuals' perceptions of the institutional environment, including the structures and regulations that make an environment feel safe (Bélanger & Carter, 2008; McKnight, Choudhury, & Kacmar, 2002). System trust can be described in two ways: (1) structural assurances, which include the security of information and clear regulations that make users feel safe, hence increasing trust, and (2) situational normality, which makes the situation appear normal and reduces uncertainty when using a service (Filieri, Alguezaui, & McLeay, 2015). A trusted technology may include elements of integrity and reliability (Sbaffi & Rowley, 2017), which can enhance individuals' experience when seeking or processing information (Alam & Ahangari, 2016). In this study, it is proposed that students' trust of the system can potentially influence the system's usefulness that they perceive:

 H_{17} Trust has a significant influence on students' perceived usefulness of e-government learning services.

A study by McKnight, Choudhury, and Kacmar (2000) stated that the main aspects related to individual trusting beliefs, trusting intentions and behaviors can be used to explain the cognitive process. For instance, the authors highlighted that a truster can determine the extent of whether or not to trust an organization based on previous experience. Based on these, it can be said that individual trusting intention can be driven by the willingness or intention of the truster to rely on the trustee (Ponte, Carvajal-Trujillo, & Escobar-Rodríguez, 2015). Consistent with these studies, the following hypothesis is as follows:

 H_{18} Trust has a significant influence on students' intention to use e-government learning services.

3.6 Learning value

Perceived value can be considered a net benefit that results from an overall assessment of a trade-off between the benefits and costs of using a service or product. In this study it refers to the learning value gained from using a service. Several previous studies investigated the influence of the perceived value of a service on users' experience with the system. For example, Evangelopoulos, Sidorova, and Riolli (2003) reported a significant effect of service-learning on perceived usefulness when students participated in service-learning projects. According to Morgan-Thomas and Veloutsou (2013), when users find the service to offer the required learning values, they tend to perceive its usefulness. Therefore, the following hypotheses are developed:

H₁₉ Students' perceived learning value has a significant influence on their perceived usefulness of e-government learning services.

 H_{20} Students' perceived learning value has a significant influence on their intention to use egovernment learning services.

3.7 Perceived usefulness

Perceived usefulness refers to the degree to which an individual believes that using the technology will improve his or her performance in a context-specific setting (Venkatesh & Davis, 2000). It has always been considered one of the main predictors of user adoption, due to the significant correlations reported in previous studies that are related to both current and future

self-reported system usage. Within the e-government context, individuals' views or opinions about a specific service may be articulated from one to another based on the antecedents that shape the experience (Carter & Bélanger, 2005; Hamid, Razak, Bakar, & Abdullah, 2016). Based on these perspectives, we considered formulating the following hypothesis:

 H_{21} Students' perceived usefulness has a significant influence on their intention to use egovernment learning services.



Figure 1 shows the proposed model.

Figure 1: Hypothesized model

4. Method

This study employed a survey method to collect the quantitative data required for examining the proposed hypotheses.

4.1 Respondents

The purposive sampling method was used to select students from Sultan Qaboos University. The criteria for choosing the students was based on their familiarity with e-government initiatives in Omanuna portal. In addition, students at all levels were asked to participate until the required number is reached. This process has been widely used by many previous studies and has proven to be efficient in obtaining the desired sample size (Rao & Abegaz, 2017). The students were recruited from education, engineering, art, and science

backgrounds. A total of 415 students responded to the structured questionnaire. The obtained responses were processed for initial screening and checking in SPSS. Then, partial least squares (PLS) regression analysis was conducted using SmartPLS3.

4.2 Instrument

The research instrument in this study consists of two sections: the first portion consists of the demographic part related to the participants' gender, age, school, and familiarity with egovernment. The second section consists of a set of items for each variable being studied in this work. For example, the items for measuring reputation were adapted from Casalo, Flavián, and Guinaliu (2007) to estimate students' perception about the overall assessment of the egovernment's service. A set of items proposed by Venkatesh, Morris, Davis, and Davis (2003) (e.g., based on the subjective norm, social factors, and image) for measuring social influences on individuals' intention to use e-government was adapted in this study. The main constructs for measuring information quality and system quality suggested by DeLone and McLean (1992) were used in this study using items from IS-related success studies. Trust in e-government was assessed by using seven items adapted from Corritore, Marble, Wiedenbeck, Kracher, and Chandran (2005) and (Colesca, 2009). These items were mainly designed to measure individuals' trust in online and government agencies. In addition, this study adopted four items to estimate students' perceived usefulness of the e-government system. The items were mainly adapted from Venkatesh and Davis (2000), which many studies have proven to offer a reliable measure of individuals' experience with technology. Three items for measuring individuals' intention to use the system from Venkatesh and Davis (2000) and Venkatesh et al. (2003) were used in this study. These items were commonly used to understand the behavior of users with respect to a specific system. All items were measured using a five-point Likert-type scale (1=strongly disagree; 5=strongly agree). All students were made aware of the purpose of the research and their role in this study by providing a brief description prior to filling the questionnaire. Students were also aware that their responses are being linked to the use of Omanuna portal (see Appendix)-the main provider of e-government learning services. We also notified all respondents that their answers to the questionnaire would remain confidential and anonymous.

5. Results

The initial results showed an outlier value greater than 3* for 9 responses. These outliers (open dotes and '*') were detected using the cut-off MD test (De Maesschalck, Jouan-Rimbaud, & Massart, 2000). These cases were excluded from the PLS analysis (n: 406).

5.1 Demographic characteristics

From Table 1, it can be noted that the majority of the students (54%) were male and 188 students were female (46%). In addition, students' distribution with regards to their age group was as follows: 182 students were within the age group of 18-21 years; 167 students were within the age group of 22-25 years; and the rest (14%) were more than 25 years old (mostly students in the fourth year). The majority of the respondents (62.1%) stated that they were using e-government learning services from time to time; 63 respondents stated that they rarely used e-government learning services; while 48 students were found to use e-government learning services (10.6%). Finally, the distribution of the students in according to their study discipline

showed: 204 of students were undertaking Arts courses; 114 students were undertaking social science courses; and only 88 students were undertaking science courses.

Characteristics	Classification	No.	Percentage%
Gender	Male	218	53.7
	Female	188	46.3
Age	18-21	182	44.8
	22-25	167	41.1
	More than 25	57	14.1
Frequency of use	Rarely	63	15.5
	Sometimes	252	62.1
	Very Often	48	11.8
	Always	43	10.6
School	Arts	204	50.2
	Social Science	114	28.1
	Science	88	21.7

Table 1: Students	' demographic	characteristics	(N=406)
		D . 0/	

5.2 Component validity

In this study, the component validity of all items using both measures of convergent and discriminant validity were assessed.

5.2.1 Convergent validity

The Average Variance Extracted (AVE) result was used in this study to determine the amount of variance captured by each construct in relation to the amount of variance due to measurement error. There are some assumptions that need to be met when assessing the model's convergent validity (Fornell & Larcker, 1981), these are:

- 1. The factor loading value of each item in the model must be greater than 0.7. The initial results (see Table 2) showed that the majority of the items achieved factor loading values above 0.7. The result also showed that only one item, INFQ4, scored a loading value of 0.698 (close to 0.7), which was not removed from the model. Furthermore, there were two items (USE3: 0.511 and SYSQ5: 0.503) with factor loading equal to 0.5. These two items were removed (based on the recommendations of previous studies) from the model and the convergent validity of the new model was retested.
- 2. The composite reliability (CR) value was also inspected for all the study constructs. To determine whether a construct achieve an acceptable CR, the CR value must be greater than 0.7. As presented in Table 2, the CR result of this study was ranging from 0.840 to 0.904, which indicate a high CR value.
- 3. Here, the study showed that the AVE values for all constructs were within the acceptable range (greater than 0.5), from 0.513 to 0.680. Based on these three criteria, it can be said that the proposed model has achieved an acceptable convergent validity.

Table 2: Results summary for the measurement model

Component	Item	Main loading	AVE	Composite Reliability
Social	SOCI1	0.777	0.600	0.857
Influence (SOCI)	SOCI2	0.750		
(5001)	SOCI3	0.788		
	SOCI4	0.782		
_ .				
Reputation (RFP)	REP2	0.821	0.658	0.852
(ILLI)	REP3	0.796		
	REP4	0.816		
Information	INFO1	0 718	0 541	0 904
quality	INFO2	0.746	0.5 11	0.901
(INFQ)	INFO3	0.764		
	INFO4	0.704		
	INFO5	0.098		
	INFO6	0.725		
	INFO7	0.743		
	INFO8	0.746		
	nu qo	0.740		
Usefulness	USE1	0.821	0.591	0.852
(USE)	USE2	0.818		
	USE4	0.806		
Trust (TR)	TR1	0.729	0.556	0.897
(1K)	TR2	0.755		
	TR3	0.719		
	TR4	0.759		
	TR5	0.743		
	TR6	0.743		
	TR7	0.768		
System quality	SYSQ1	0.753	0.513	0.840
(515Q)	SYSQ2	0.773		
	SYSQ3	0.744		
	SYSQ4	0.703		
Learning value $(I F \Delta V)$	LEAV1	0.758	0.572	0.842
(LLAV)	LEAV2	0.742		
	LEAV3	0.744		
	LEAV4	0.780		
Intention	INT1	0.813	0.680	0.864

Component	Item	Main loading	AVE	Composite Reliability
(INT)	INT2	0.841		
	INT3	0.821		

5.2.2 Discriminant validity

Discriminant validity was measured by comparing the shared variance between each pair of constructs against the average of the AVEs for these constructs (Hair, Hult, Ringle, & Sarstedt, 2013). In order to assess the discriminant validity of the proposed model, cross loading and Fornell-Larcker were used in this study.

5.2.1.1 Cross loading assessment

The result showed that items loadings are higher for their corresponding components (main loading) than for others (cross-loading). In addition, the difference between main loading and cross loading was greater than 0.1.

5.2.1.2 Assessing the Fornell-Larcker criterion

In principle, Fornell and Larcker (1981) stated that to achieve an acceptable criterion value for the model, the value of AVE of one construct should be greater than the AVE value of other constructs. In this study, the Fornell-Larcker criterion reveal satisfactory results, as shown in Table 3. Since both component validity and discriminant validity were fulfilled for all components, then the inner model is ready for hypothesis testing.

	SOCI	REP	INFQ	USE	TR	SYSQ	LEAV	INT
SOCI	0.775	0	0	0	0	0	0	0
REP	0.481	0.811	0	0	0	0	0	0
INFQ	0.351	0.387	0.736	0	0	0	0	0
USE	0.392	0.371	0.407	0.769	0	0	0	0
ГR	0.381	0.213	0.491	0.461	0.745	0		
SYSQ	0.144	0.322	0.307	0.402	0.360	0.716	0	0
LEAV	0.294	0.459	0.346	0.425	0.390	0.209	0.756	0
INT	0.391	0.211	0.352	0.398	0.234	0.476	0.416	0.825

Table 3: Correlations and discriminant validity N= 406

Note: Square root of the AVE on the diagonal

Figure 2 shows the tested model after passing the validity tests mentioned above. The distribution of the items across the single construct achieved an acceptable composite validity, with AVE values greater than 0.7.



Figure 2: Results of the measurement model assessment

5.3 Structural model assessment

After achieving an acceptable validity measure for all constructs (as reported earlier), we further estimated the strength of the effect among variables in the structural model using path coefficients for each arrow between two variables. We used the *t-statistics* to test if the coefficient was significant. In this study, the sub-samples for running the bootstrapping test was set at 5000 re-samples. Table 4 and Figure 3 shows the testing results for the proposed relationships. A total of 14 hypotheses out of 21 were significant.

The estimates of the R^2 values represent the amount of variance in the dependent variable explained by the independent variables. In general, R^2 values of 0.00 - 0.25 indicates small effect; 0.25 - 0.50 indicates medium effect; and 0.50 - 0.75 indicates large effect (Hair et al., 2013). The proposed model was found to explain 46.00% of the total variance for the dependent variable.

	Effect	Path coefficient	Mean	Standard Deviation	t value	p value	Decision
\mathbf{H}_{1}	$REP \rightarrow TR$	0.133	0.134	0.059	2.261*	0.024	Supported
${\rm H}_2$	$\text{REP} \rightarrow \text{USE}$	0.125	0.122	0.060	2.075*	0.038	Supported
H ₃	REP LEAV	0.061	0.060	0.038	1.623	0.105	Not Supported
${ m H}_4$	$REP \twoheadrightarrow INT$	0.003	0.138	0.052	1.025	0.306	Not Supported
H ₅	SOCI \rightarrow TR	0.244	0.241	0.080	3.041**	0.002	Supported
${ m H}_6$	SOCI \rightarrow USE	0.135	0.126	0.076	1.787	0.074	Not Supported
H_7	SOCI \rightarrow LEAV	0.435	0.423	0.054	8.010***	0.000	Supported
$\mathbf{H_8}$	SOCI \rightarrow INT	0.269	0.264	0.059	4.549***	0.000	Supported
H9	INFQ \rightarrow TR	0.138	0.142	0.082	1.684	0.092	Not Supported
H_{10}	INFQ \rightarrow USE	0.190	0.132	0.004	2.190*	0.029	Supported
H_{11}	$\mathrm{INFQ} \rightarrow \mathrm{LEAV}$	0.171	0.179	0.046	3.762***	0.000	Supported
H_{12}	$\mathrm{INFQ} \rightarrow \mathrm{INT}$	0.100	0.104	0.035	2.831**	0.005	Supported
H ₁₃	SYSQ \rightarrow TR	0.311	0.312	0.084	3.685***	0.000	Supported
${ m H}_{14}$	$\mathrm{SYSQ} \rightarrow \mathrm{USE}$	0.076	0.076	0.060	1.257	0.209	Not Supported
H ₁₅	$\mathrm{SYSQ} \mathrm{LEAV}$	0.196	0.200	0.051	3.859***	0.000	Supported
${ m H}_{16}$	$\mathrm{SYSQ} \mathrm{INT}$	0.057	0.056	0.056	1.025	0.305	Not Supported
H ₁₇	TR \rightarrow USE	0.218	0.228	0.071	3.085**	0.002	Supported
${ m H}_{18}$	TR \rightarrow INT	0.003	0.008	0.060	0.042	0.967	Not Supported
H19	$LEAV \rightarrow USE$	0.247	0.246	0.062	3.980***	0.000	Supported
${ m H}_{20}$	LEAV INT	0.206	0.199	0.080	2.575**	0.010	Supported
H_{21}	USE \rightarrow INT	0.166	0.168	0.050	3.343**	0.001	Supported
Significant at level of *** p<0.001 **p<0.01, * p<0.05 (1-tailed test)							

Table 4: Hypotheses testing results



Figure 3: Bootstrapping (t-values) results after eliminating the path coefficient of not supported constructs

5.4 Predictive relevance Q2

In this study, the predictive relevant of Q^2 was used to identify the predictive validity of a complex combination of variables. Based on the Q^2 result shown in Table 5., it can be concluded that the path model has a predictive relevance value above zero.

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Endogenous Latent Variable	R^2 Value	Q^2 Value				
TR	0.460	0.425				
USE	0.537	0.464				
LEAV	0.455	0.350				
INT	0.408	0.327				

Table 5: Results of testing Q^2 for predictive relevance

As for hypotheses testing, the result showed that reputation of e-government learning services had a significant influence on students' trust (β =0.133, t=2.261, p<0.024). The potential of shaping the Website's reputation to enhance trust has always been considered in articulating the user's experience with a particular service (Einwiller, 2003). This study found that reputation of e-government learning services has a significant influence on students' perceived usefulness (β =0.125, t=2.075, p<0.038). This study also examined the influence of reputation of e-government learning services on students' perceived learning value. The results showed no significance influence of reputation on students' perceived learning value (β =0.061, t=1.623, p<0.105). Although many previous studies have shown how several behavioral mechanisms underline the effects of reputation on behavioral outcomes, there seems little evidence about the

effects of reputation on an individual's perceived learning value. The same was found for the effect of e-government learning services reputation on students' intention to use was not significant (β =0.003, t=1.025, p<0.306).

The measure of social influence and trust in an online environment increasingly appears to be an important key to enhancing the accuracy of a service or system (Kim & Srivastava, 2007). The influence of social influence on students' trust towards using e-government learning services was significant (β =0.244, t=3.0411, p<0.002). However, the results showed no significant effect of social influence on students' perceived usefulness of e-government learning services (β =0.135, t=1.787, p<0.074). The relationship between social influence and other adoption related factors in studies about IT has been regularly found to be not significant (Eckhardt et al., 2009). As for the impact of social influence on students' perceived learning value, the result showed a significant relationship (β =0.435, t=8.010, p<0.000). Also, the effect of social influence on students' intention to use e-government learning services was significant (β =0.264, t=4.549, p<0.000).

We found no significant differences between information quality and students' trust in egovernment learning services (β =0.138, t=1.684, p<0.092). This study found a significant influence of information quality of e-government learning services on students' perceived usefulness (β =0.190, t=2.190, p<0.029). In addition, a positive influence of information quality on students' perceived learning value with e-government learning services (β =0.171, t=3.762, p<0.000) was found. According to Radwan et al. (2014), information quality and learning are two relevant factors that may potentially influence individuals' decisions and valuations when using online systems. The influence of information quality on students' intention to use egovernment learning services was statistically significant (β =0.100, t=2.831, p<0.005). This implies that the quality of information provided by e-government learning services has been thought to lead to better support for students.

The result showed a significant influence of system quality on students' trust in egovernment learning services (β =0.311, t=3.685, p<0.000). According to Vance et al. (2008), system quality is relevant to the concept of trust because the literature examined association between these two attributed showed that technical aspects of IT artifacts affect users' willingness to trust. Meanwhile, the results showed that system quality had no significant influence on students' perceived usefulness of e-government learning services (β =0.076, t=2.257, p<0.209). It is believed that individuals' abilities to understand and perceive system dynamics correctly may not necessarily results in positive perception of its usefulness to finish a task. The influence of system quality on students' perceived learning value from e-government learning services was significant (β =0.196, t=3.859, p<0.000). On the other hand, system quality had no influence on students' intention to use e-government learning services (β =0.057, t=1.025, p<0.305).

As for the influence of students' trust and perceived learning values on their perceived usefulness of e-government learning services, the result was significant (β =0.218, t=3.085, p<0.002). The result related to the impact of trust in e-government learning services on students' intention to use was not significant (β =0.003, t=0.042, p<0.967). The results indicate that with little actual experience, non-user have no basis for relating their trust or lack of trust into a more concrete intention to use.

In addition, this study found students' perceived learning value to impose a significant influence on their perceived usefulness of e-government learning services (β =0.247, t=3.980, p<0.000). Walugembe and Mubiru (2015) stated that the more individuals learn about the

system, the higher the possibility of perceiving the usefulness of it. This study also found a positive influence of students' perceived learning value on their intention to use e-government learning services (β =0.206, t=2.575, p<0.010). It is anticipated that when students find e-government learning services to provide the necessary resources, they will positively perceive its learning values and accordingly drive their intention to use them in the future. Finally, the results also showed a positive influence of students' perceived usefulness on their intention to use e-government learning services (β =0.166, t=3.343, p<0.001).

6. Discussion

This study investigated the existent to which reputation, social influence, information quality and system quality of e-government learning services would influence students' trust, perceived usefulness, and learning value. We also expected that the effect from these variables would influence students' intention to use e-government learning services. The results showed that reputation of e-government learning services had a significant influence on students' trust. According to Lamothe and Lamothe (2011), government initiatives and services are eager to acquire and maintain their reputations, particularly to help users build trusting relationships with these services and initiatives. This positive relationship between reputation and students' trust in e-government learning services support the work of Burda and Teuteberg (2014) who stated that trust can be increased through the provider's reputation. This study finding also adds to the work of Shao (2018) about the role of user experience in shaping the relationship between platform reputation and trust in the platform. This study also found that reputation of e-government learning services had a significant influence on students' perceived usefulness. Alrushiedat and van der Pol (2013) stated that learners will strengthen their belief about the usefulness of a service if it is provided by a reputed organization. This implies that the reputation of learning services established by an initiative may increase an individual's perceived usefulness of the technology. This result supports the work of Hakami (2018) who found a significant relationship between system's reputation and users' usefulness in a learning setting. It also adds to the work of Gronier and Lambert (2010) who suggested investigating the relationship between reputation and usefulness in the model to measure the perceived quality of e-government learning services. The influence of reputation on students' perceived learning value of e-government learning services was not supported. This insignificant influence can be due to that a learning system interacts with reputation to affect error reduction (Rhee, 2009), which may not necessarily leads to a better learning values. In addition, it is assumed that reputation may not be related to the organization's ability to offer a better learning values or resources to its individuals.

The influence of social influence on students' trust towards using e-government learning services was significant. This significant influence is supported by many previous studies (e.g., Li, Hess, & Valacich, 2006; Montoya, Massey, & Khatri, 2010; Seufert et al., 2016) which showed that the opinions of others, subjective norm, can potentially influence individual's trust beliefs. According to Chaouali, Yahia, and Souiden (2016) social influence in developing countries may have a strong impact on individual's believes of a service or product, which tend to direct his/her trust value to it. No significant effect of social influence on students' perceived usefulness was found in this study. This can be due to the fact that such relationship becomes stronger with increasing levels of involvement (Terzis et al., 2012) which, as a result, might influence on students' perceived learning value, the result was significant. According to Hoban (2004), the effect of social influence on learning is driven by the community of sharing each

other's activities based on their common purposes. Therefore, it is assumed that students may have found the use of e-government learning services to provide them with the basis for sharing information related to their educational needs. This result supports few previous studies on the role of social influence and learning in inducing the adoption of technology (e.g., Peng, Fan, & Dey, 2011). Social influence had a significant influence on students' intention to use egovernment learning services. Within the context of developing countries, the role of teachers, environment, and other peers in the adoption and diffusion of an e-government technology may have influenced students to adopt and use it as well. This is supported by Taiwo and Downe (2013) who reviewed multiple studies related to the impact of social influence on individuals' intention to use technology.

We found no significant differences between information quality and students' trust in egovernment learning services. Such relationship may be due to that students were not very concerned about the quality of information provided to them than the services and the delivery method. This kind of believe can be considered as the main motive that led students to assume the role of e-government learning services as a channel where they should seek answers to their education-related questions or build connections with others. Our finding supports the work of Chuang and Fan (2011) who reported no significant impact of information quality on users' trust towards online services. A significant influence of information quality on students' perceived usefulness of e-government learning services was found. According to Tan, Benbasat, and Cenfetelli (2013), service and the quality of the offered content are significant contributors in a study of an e-government website. This is because information quality is vital towards influencing the use of online systems (Balakrishnan & Gan, 2016). This finding is in line with many previous studies on electronic systems like Tella (2010) and Gan and Balakrishnan (2017) who reported a significant relationship between the quality of information provided with the perceived usefulness of individuals. The results also showed a positive influence of information quality on students' perceived learning value with e-government learning services. Here, it is assumed that when students perceive the quality of information to be relevant, they may develop a positive perception of its learning value. This view is in line with the work of Gallagher and Sixsmith (2016) who stated that information quality and learning outcomes are required in any online learning sphere. In addition, information quality had a significant effect on students' intention to use e-government learning services. The importance of information quality and its role in driving individuals' intention to use online technology has been highlighted and strongly validated in prior research. For example, Petter and McLean (2009) found that users' perceived information quality can potentially influence their intention to use technology through the facilitation of information seeking behavior an individual process when interacting with the technology.

This study found no significant influence of system quality on students' trust in egovernment learning services. Vance et al. (2008) stated that students' perceptions of system quality can potentially influence their trust to use it in the future. In addition, Belkhamza and Wafa (2009) added that in an online environment, students may perceive system dynamics and errors as a sign that would negatively influence their behavior certainty and trust. This finding supports the work of Vance, Lowry, and Wilson (2017) who reported the exceptional role of website quality in driving individuals' trust, which often gives at least tacit consideration of perceptions of security and risk. Meanwhile, system quality had no significant influence on students' perceived usefulness of e-government learning services. This result is not in line with many previous works (e.g., Al Shibly, 2011; Alkhowaiter, Dwivedi, & Williams, 2013; Ifinedo,

2007; Khan & Qutab, 2016; Shin, Jung, & Chang, 2012) that investigated the impact of system quality on users' general perception of online system usefulness. Bravo, Santana, and Rodon (2016) stated that system quality may indirectly influence individuals' perceived usefulness through other means related to the role of system's assistance in informating role. Therefore, this study offers, in a way, a new evidence to the literature on how the quality of a system may not be relevant to students' perceived ease of use. The influence of system quality on students' perceived learning value from e-government learning services was significant. Ho (2009) reported that system quality and learning behavior are usually influenced by the innovation in educational technology for students to interact and collaborate effectively. It is also possible that students' involvement in the e-government services will have a cross-level moderation effect on the relationship between system quality and learning transfer (Cappetta, Maruping, Madden, & Magni, 2015). From these, it can be said that higher education in developing countries may need to consider the quality of e-government learning services in facilitating students' learning, thus supporting ownership of learning values. However, system quality had no influence on students' intention to use e-government learning services. According to Wibowo, Santoso, and Setyohadi (2018), system quality may not necessarily influence the usage intention of individuals but there may be other antecedents related to the individuals' characteristics that could change the tendency of this relation. Meanwhile, this finding is not a surprise as most recent studies have suggested that system quality has no significant effect on users' intention to use technology.

Our findings showed that students' trust in e-government learning services can influence their perceived usefulness. This is because, on a trusted site, a user may assume the credibility of information in a way that does not require him/her to waste time and cognitive effort to go through other external sources. This finding is in line with many previous works on online systems (e.g., Guo, Shim, & Otondo, 2010; Hernandez-Ortega & Jimenez-Martinez, 2013). It is believed that when students perceive the environment to be trustworthy and provide the required credibility, they will likely perceive its usefulness to their learning. The impact of trust on students' intention to use e-government learning services was not significant. This finding is in line with previous works like Ayo, Mbarika, and Oni (2015) who stated that people's trust in a system will influence their participation in e-services but may not necessarily influence their intention to use it.

Students' perceived learning value was found to impose a significant influence on their perceived usefulness of e-government learning services. This finding support the work of Balog and Pribeanu (2010) which showed an association between learning and usefulness. In addition, students' perceived learning value had a significant influence on their intention to use e-government learning services. Al-rahmi, Othman, and Yusuf (2015) asserted that when online users are provided with the learning atmosphere that allow them to share and exchange knowledge and experiences, they are more likely to build a positive intention to use it. This finding seems to support previous studies on perceived learning and intention like Hussein, Omar, and Zayadah (2016) which found a positive significant relationship between learning and intention to share knowledge in an online context. This implies that the type of learning activities and services provided by the online environment may be the reason that drive students' intention to use e-government learning services.

Finally, a positive influence of students' perceived usefulness on their intention to use egovernment learning services was found. This was not a surprise as there are many previous studies (e.g., Belanche, Casaló, & Flavián, 2010; Chatzoglou, Chatzoudes, & Symeonidis, 2015; Chesney, 2006; Sharma, Shakya, & Kharel, 2014) which have reported a similar finding. In addition, it is possible that the relationship between usefulness and intention was stronger among goal-directed users than among experiential users when using online services (Sánchez-Franco & Roldán, 2005). This is also supported by Fusilier and Durlabhji (2005) who found a positive relationship between perceived usefulness and users' intention, especially for those with high levels of internet experience. As such, since most university students are familiar with different internet services, then it is more likely that their intention to use e-government learning services will be increased.

7. Implications

This study offers some implications for practitioners and researchers concerned about the application of e-government learning services in developing countries. First, this study modeled the relationships between the key factors of reputation, trust, perceived usefulness, perceived learning values, information quality, and system quality on students' intention to use egovernment learning services. The validated model can be used for other similar e-government projects in developing countries to test and enhance the level of e-government acceptance among university students. The proposed relationships can be useful for the development of students' interest and participation in e-government initiatives for learning purposes. For example, these relationships can provide the first reference and a baseline to better understand e-government learning services use in the region, to foster future studies, and to help policy makers to start a policy dialogue regarding how to restructure their initiatives to meet students' learning needs without suppressing innovation. In addition, outcomes from this study can help expand the IT capabilities of universities in developing countries by providing new ways to access learning materials, thus offering new experience for the students. The findings also offer important evidence for educational decision makers on how to increase perceived learning value of individuals when using e-government learning services mainly through providing the necessary information and system quality in order to retain students' interest in learning. This can help extend the current theoretical understanding for institutional theory and information system model by showing how universities in developing countries can provide higher information and system qualities via e-government learning services. It is anticipated that understanding the association between the main factors effecting students' use of e-government learning services can predict future learning trends of e-government use in a university setting, thus helping decision makers plan ahead, prioritize tasks, and make better decisions. Knowledge about students' intention to use e-government learning services can help universities to focus on factors that are more likely to have usage increase. For example, universities in developing countries can train academic staff and students in order for them to adopt e-government learning services and thus provide valuable knowledge for better outcomes.

8. Limitations and future works

A number of limitations emerged from this study may need to be addressed in future works. This study was limited to students from one developing country. This study considered students undertaking different undergraduate and postgraduate programmes from different departments in order to provide an in-depth understanding of students believes of e-government learning services use. In addition, this study did not consider certain culture values because it is difficult to study them partially, and it is not an easy concept to define. Aspects related to the security and privacy of e-government learning services were not covered in this study mostly because less focus was given to these dimensions beside that trust cover some of these aspects.

Based on these limitations, it is recommended that future studies validate the proposed model among students from other universities. It is also recommended that future works examine the model on a wider range of disciplines with the consideration of certain individuals' characteristics that may reveal new findings. We feel that future works should extend the validated model with factors that we found irrelevant to the context of this study. Finally, researchers may also consider investigating the use behavior of e-government learning services among university students.

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