Full research paper

EXPLORING THE RELATIONSHIP AMONG E-SERVICE QUALITY, E-TRUST, E-SATISFACTION AND LOYALTY AT HIGHER EDUCATION INSTITUTIONS

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ABSTRACT

We examine the effect of e-service quality through E-S-QUAL dimensions of efficiency, fulfilment, system availability, and privacy on e-trust, e-satisfaction and loyalty of students from public and private universities in Jakarta, Indonesia. A total of 304 undergraduates was employed as respondents, and the hypotheses were tested using Structural Equation Modelling (SEM). The findings revealed that efficiency and fulfilment significantly affect e-satisfaction, while fulfilment and privacy significantly affect e-trust. Fulfilment has the most substantial effect on e-satisfaction and e-trust that supports prior studies. Moreover, the relationships between e-trust, e-satisfaction, and loyalty are confirmed. Theoretical and managerial implications are presented.

KEYWORDS

E-service quality, E-trust, E-satisfaction, loyalty, Structural Equation Modelling

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Highlights

- *The effect of e-service quality on e-trust, e-satisfaction, and students' loyalty through E-S-QUAL dimensions and Structural Equation Modelling (SEM) approach.*
- *Efficiency and fulfilment significantly affect e-satisfaction.*
- *Fulfilment and privacy significantly affect e-trust.*
- *E-trust and e-satisfaction significantly affect students' loyalty.*

INTRODUCTION

The loyalty of universities' students has become a noteworthy issue to survive in highly competitive landscapes and to compete with other universities (Leonnard, 2018a). Both public and private universities begin to develop their specific strategies with a focus on their students (Leonnard, 2018b). Besides, the existence of word ranking universities has created privileges in some universities with claims of quality and service better than others. It turns out that loyalty and its key predictors have become the topic of interest in literature since a long time ago. Factors such as service quality (Sembiring, 2013; Rojas-Méndez and Vasquez-Parraga, 2015), image (Brown and Mazzarol, 2006), trust (Rojas-Méndez et al 2009; Leonnard and Susanti, 2019) and satisfaction (Bergamo, Giuliani and Galli, 2011; Leonnard et al., 2015; Giner and Rillo, 2016; Leonnard, 2017) are found to be the main predictors of university students' loyalty.

The presence of the internet has brought revolutionary changes in the way how goods and services are traded, as well as the higher education service. The university has shifted from traditional service quality to electronic service quality (e-service quality). The activities such as universities and course enrolment, course delivery, course support, electronic libraries, payment confirmation, regular information and promotion such as international programs and courses offered to prospective students have been handled online. The media adopted are no longer limited to universities' web sites, but are expanding into universities' web portals and social media. Intensive studies on the effect of e-service quality on e-satisfaction and e-loyalty and the

moderating effect of variables such as trust, perceived value, purchase size, and motivation have been carried out in the last 20 years. The relationship of efficiency, fulfilment, system availability and privacy with e-satisfaction has been significantly proven by prior studies. Quan (2010), Sheng and Liu (2010), and Tandon, Kiran, and Sah (2017) confirmed that all of the dimensions have positive effects on e-satisfaction. Sheng and Liu (2010), Ariff et al. (2013) and Ting et al. (2016) also signified that fulfilment has a positive effect on e-satisfaction. Mohammed et al. (2016) used information quality indicators that represented fulfilment and interactivity and reliability to represent system availability. The results of the study indicated that efficiency, information quality, interactivity, reliability and privacy have positive effects on e-satisfaction of e-tourism services. Interactivity and reliability have a dominant effect on e-satisfaction. Conversely, efficiency and privacy have the weakest effect on e-satisfaction. The results validate the study of Wolfmbarger and Gilly (2003) and Swaid and Wigand (2007). Furthermore, Kim, Jin, and Swinney (2009) found that efficiency does not have a significant effect on e-satisfaction. In terms of e-trust predictors, Kim, Jin, and Swinney (2009), Hansen and Jonsson (2013), and Chek and Ho (2016) found that both variables of fulfilment and privacy have significant effects on e-trust.

Moreover, e-satisfaction and e-trust are antecedents of loyalty (Anderson and Srinivasan, 2003; Kim, Jin, and Swinney, 2009). Reichheld and Schefter (2000) revealed that e-trust is the critical predictor of consumer loyalty to online sites. The argument has also been supported by Pitta, Franzak, and Fowler (2006) and Kim, Jin, and Swinney (2009). The effect provided by the variable is not only in a direct term but also by indirect effect through e-satisfaction (Anderson and Srinivasan, 2003). Jin and Park (2006) and Kim, Jin, and Swinney (2009) have proven that e-trust has a positive effect on e-satisfaction. However, most of the studies are conducted practically on e-commerce and online shopping sites. The relationship between these variables in the educational sector is still not clear. In this study, we examined the contributions of e-service quality, e-trust, and e-satisfaction to student loyalty of state and private universities in Jakarta, Indonesia.

MATERIALS AND METHODS

Data collection and analysis

The selection of universities in this study was based on a convenience sampling method at a state university and two private universities in Jakarta, Indonesia. Respondents selection is based on a random sampling method. All respondents are undergraduate students. The online sites are websites, portals and social media with dual languages – Bahasa and English. A total of 304 data from respondents was collected, and that was analysed through Structural Equation Modelling (SEM) using AMOS 23. In the survey, respondents were asked whether they used one of the universities' information media of web sites, portals, or social media and the type of social media that were most frequently accessed. It is to ensure that respondents are fit to provide their perceptions of the items asked in the questionnaires. A total of 63.48% of respondents were female, and 36.53% were male. Most of the respondents were between 20 and 23 years old (93.42%), 23 to 26 years (5.59%), 26 to 29 years (0.65%), and only a person was more than 30 years old (0.32%). The most frequently accessed types of university media were social media (43.09%), portals and websites (28.61% and 28.28%, respectively). Instagram was the most frequently accessed type of social media (88.81%), followed by Facebook (5.59%), and Twitter (2.30%).

Research Instruments

Indicators of e-service quality (E-S-QUAL)

Several methods have been developed to measure e-service quality. In the beginning, the method was purposed to measure e-service quality of online shopping sites. Some popular methods are WebQual (Barnes and Vidgen, 2002), which is used to measure e-service quality in e-commerce by employing five indicators: design, usability, trust, information, and empathy. Another method is SITEQUAL (Yoo and Donthu, 2001), which consists of four indicators: ease of use, aesthetic design, processing speed, and security. However, the method provides a disadvantage that respondents can do the assessments without completing purchases. Thereafter, Wolfinbarger and Gilly (2003) developed eTailQ, which consisted of four indicators: website design, fulfilment or reliability, security, and customer service. However, both website design and customer service are considered to be less consistent and distinct. To improve and complete the shortcomings in the previous methods, Zeithaml, Parasuraman, and Malhotra (2002) suggested five indicators of e-SERVQUAL which consisted of content and information availability, ease of use, privacy, graphic style, and reliability. Later in 2005, these indicators were refined into a new method called E-S-QUAL with four indicators of efficiency, fulfilment, system availability, and privacy (Parasuraman, Zeithaml, and Malhotra, 2005). It is developed to evaluate e-service quality of online shopping sites, not on other forms of internet sites such as portals, free download sites, job sites or newspaper sites aimed at particular purposes such as advertising other than online shopping (Parasuraman, Zeithaml, and Malhotra, 2005).

Some other methods, such as NetQual (Bressolles and Nantel, 2008), ESELFQUAL (Ding, Hu, and Sheng (2011) were developed after that period. However, most of the methods are aimed to evaluate e-service quality of online shopping sites. Moreover, there were E-GOVSQUAL-RISK (Rotchanakitumnuai, 2008), E-GOV-SQUAL (Kaisara and Pather, 2011), PUBLIC VALUE OF E-GOVERNMENT (Karunasena and Deng, 2012) to evaluate e-service quality of public sectors, and LibQUAL which is performed for libraries (Zhang and Bi, 2017). Correctly, in the higher education institutions (HEI), e-service quality has been used to evaluate academic libraries by using e-SQ (Amin and Ahmad, 2012) and e-SERVQUAL to measure student perceptions of universities' web sites (van Iwaarden et al

2004). Lee, Choi, and Jo (2009) used the end-user computing satisfaction model consisting of user ability, design, playfulness, and support services available to evaluate student satisfaction of the university's portal. Chen (2011) and Tella and Bashorun (2012) used the dimensions of ease of use, information quality, and system quality. Additionally, Shaltoni et al (2015) used dimensions of information quality, system quality, and user ability to evaluate the perceived service quality of university's portals in developing countries. Most of the dimensions used in the literature are developed based on one-SERVQUAL dimensions. In this study, we used the latest version of e-SERVQUAL, e-core service quality scale (E-S-QUAL), as a result of the reduction of previously developed dimensions. E-S-QUAL consists of efficiency, fulfilment, system availability, and privacy. Efficiency is the ease and speed of accessing information on the sites. Fulfilment is the ability of the sites to provide the information required. System availability is the ability of the system to work according to its functions and privacy is the level of trust of the sites in maintaining consumer information confidentiality (Parasuraman, Zeithaml, and Malhotra, 2005). In this study, we employ a multiple-item scale, E-S-QUAL developed by Parasuraman, Zeithaml, and Malhotra (2005), which consisted of efficiency, system availability, fulfilment, and privacy.

Measuring e-trust, e-satisfaction and loyalty

Chen and Dhillon (2003), Palvia (2009), and Oliveira et al (2019) suggest three dimensions to measure e-trust that are free to be used on all types of transactions conducted through the internet, namely competence, integrity, and benevolence. Competence is the organization's ability to fulfil the promises offered; integrity is a condition where the organization acts consistently and honestly in providing all information on the sites. Benevolence is the ability of the organization to side with the consumer' interests. In terms of e-satisfaction, Udo, Bagchi, and Kirs (2010) have used the dimensions of the ability of online sites to provide satisfaction compared to the experience in previous online sites, the ability of online sites to provide services higher than consumer expectations, and pleasant experience provided. Nisar and Prabhakar (2017) used similar dimensions of the ability of online sites to provide higher services and experience than consumer expectations and enjoyment to measure e-satisfaction. In terms of HEI, Cheung and Lee (2011) and Shaltoni et al (2015) used the dimensions of the level of student satisfaction with information and systems to measure e-satisfaction of the e-learning portal.

Finally, in terms of loyalty, since universities' students do not make direct purchases as in e-commerce, e-loyalty dimensions become less significant. Therefore, in this study, we use the indicators suggested by Zeithaml, Berry, and Parasuraman (1996) and Ganesh, Arnold, and Reynolds (2000). It consists of favourable behavioural intentions consisting of positive word of mouth (WOM) and unfavourable behavioural intentions consist of switching behaviour and complaining behaviour. In this study, e-trust is measured using the dimensions of Chen and Dhillon (2003) which consisted of competence, integrity, and benevolence while e-satisfaction was measured by using the dimensions of Anderson and Srinivasan (2003), Udo, Bagchi, and Kirs (2010) and Nisar and Prabhakar (2017) which consisted of the ability of websites, social media and university's portals to provide satisfying experiences, the ability of the online sites to provide higher service and information quality than students' expectation, and pleasant experience offered. Loyalty was measured by using the dimensions of Zeithaml, Berry, and Parasuraman (1996) and Ganesh, Arnold, and Reynolds (2000). There are eleven hypotheses to be tested in this study, namely:

H1. Efficiency has a positive effect on e-satisfaction
H2. Efficiency has a positive effect on e-trust
H3. System availability has a positive effect on e-satisfaction
H4. System availability has a positive effect on e-trust
H5. Fulfilment has a positive effect on e-satisfaction
H6. Fulfilment has a positive effect on e-trust
H7. Privacy has a positive effect on e-satisfaction
H8. Privacy has a positive effect on e-trust
H9. E-trust has a positive effect on e-satisfaction
H10. E-trust has a positive effect on the loyalty
H11. E-satisfaction has a positive effect on the loyalty

The developed questionnaires consisted of five items for efficiency, two items for system availability, six items for the fulfilment, two items for privacy, four items for e-trust, three items for e-satisfaction, and three items for loyalty. The items were measured by a five Likert scale (1= strongly disagree; 5= strongly agree). The final set consisted of 60 variables, which were 32 exogenous and 28 endogenous variables. Reliability testing was performed to measure the internal consistency of the items through Construct Reliability (CR) and Average Variance Extracted (AVE) tests. The results in Table 1 indicated that all constructs have CR>0.70 cut-off values and AVE>0.50 cut-off values.

Items	Symbols	Std. loadings	CR	AVE
Efficiency			0.927	0.719
Web sites, portals and social media are easily accessible	X1	0.733		
Transactions can be completed quickly	X2	0.703		
Pages load quickly	X3	0.748		
Web sites, portals and social media are easy to use	X4	0.813		
I can sign in to the system quickly	X5	0.847		
Fulfilment			0.799	0.762
I can easily find what I was looking for on websites, portals and social media	X6	0.735		
All of the information is very well presented	X7	0.748		
The universities' online sites provide attractive design and layout	X8	0.720		
Information updates are carried out regularly	X9	0.822		
The information provided meets students' needs	X10	0.883		
The universities online sites help students a lot with their academic activities	X11	0.890		
System availability			0.823	0.700
The system can be accessed at anytime, anywhere from any device	X12	0.773		
The operating system never stops functioning without notice	X13	0.738		
Privacy			0.869	0.769
The universities online sites do not share my personal information with other parties	X14	0.759		
I consider the universities' online sites are very safe	X15	0.851		
E-satisfaction			0.939	0.840
I like to search for information through universities' web sites, portals, and social media	Y1	0.684		
Overall, I am satisfied with the experience of using universities' web sites, portals, and social media	Y2	0.935		
I am satisfied with the information and services provided through the universities' web sites, portals, and social media	Y3	0.953		
E-trust			0.960	0.827
I trust all information provided through the universities' web sites, portals and social media	Y4	0.810		
All information provided is relevant and accurate	Y5	0.863		
All information provided is consistent	Y6	0.876		
I believe that the universities provide all information through web sites, portals and social media in order to facilitate students with effective teaching and learning process	Y7	0.772		
Loyalty			0.854	0.671
Positive WOM	Y8	0.886		
No switching behaviour	Y9	0.773		
No complaining behaviour	Y10	0.528		

Table 1: Construct reliability results

RESULTS AND DISCUSSIONS

The evaluation of the goodness of fit statistics indicates that the overall model was not rejected (Chi-square statistics (χ^2))= 667.252, degree of freedom (*df*)= 258 (*p*-value = 0.000), Goodness of Fit Index (GFI)= 0.847, Adjusted Goodness of Fit Index (AGFI)= 0.807, Normed Fit Index (NFI)= 0.889, Comparative Fit Index (CFI)= 0.928, Tucker-Lewis index (TLI)= 0.916, Incremental Fit Index (IFI)= 0.929, Root Mean Square Error of Approximation (RMSEA)= 0.072, Root Mean Square Residual (RMR)= 0.039). The test on the hypotheses in Table 2 and Figure 1 indicates that seven of the eleven hypotheses are not rejected (H1, H5, H6, H8, H9, H10, H11). The effect of efficiency on e-satisfaction (H1) is significantly positive (β=0.031). This finding supports prior studies of Quan (2010), Sheng and Liu (2010), Mohammed et al (2016), and Tandon, Kiran, and Sah (2017) on online shopping sites. Similarly, the effect of fulfilment on e-satisfaction (H5) is significantly positive (β=0.589). This finding supports studies of Kim, Jin, and Swinney (2009), Quan (2010), Sheng and Liu (2010), Ariff et al (2013), and Ting et al (2016). Conversely, privacy and system availability do not significantly affect e-satisfaction.

Furthermore, e-trust is only affected by two E-S-QUAL dimensions of fulfilment and privacy which support H6 and H8. The effect of fulfilment and privacy on e-trust is significantly positive (Coeff.=0.466 and Coeff.=0.267, respectively). These findings support Kim, Jin, and Swinney (2009), Hansen and Jonsson (2013), and Chek and Ho (2016). Moreover, fulfilment has the most powerful effect on e-satisfaction and e-trust. This supports Kim, Jin, and Swinney (2009). The findings support

Parasuraman, Zeithaml, and Malhotra (2005) as well, which states that fulfilment is the most critical predictor of e-service quality (E-S-QUAL), especially on web-based sites. Since, Parasuraman, Zeithaml, and Malhotra (2005) obtained these findings in a study conducted on online shopping sites, it can be concluded from this study that the similar paths also apply to universities' sites that do not carry out the purchasing process such as online shopping sites. The findings also indicate that ease of access, attractive design and appearance, and the ability of information provided to fulfil student desires have higher effects than other dimensions.

Conversely, privacy has a weak effect on e-trust. This is contrary to the study of Cheung and Lee (2006) that privacy is an essential predictor of e-trust. According to Wolfinbarger and Gilly (2003), the more often consumers get access to the web sites, the more privacy becomes less critical. It is because consumers consider themselves more experienced and understand the risk mitigation that might ensue. However, this finding is based on the experience of consumers doing purchasing transactions on online shopping sites. In the case of university sites in this study, activities such as purchasing, checking out, and credit card payments or bank transfers did not occur. Web sites and portals are often integrated with all faculties and study programmes. Students access the online sites for course enrolment, course support such as scheduling, examination, remedial, and access to an electronic library. This caused privacy to be less important compared to its effect on online shopping sites.

Hypotheses	Paths	Coeff.	Findings
H1	Efficiency -> E-satisfaction	0.031***	Not rejected
H2	Efficiency -> E-trust	0.064	Rejected
H3	System availability -> E-satisfaction	-0.193	Rejected
H4	System availability -> E-trust	0.088	Rejected
H5	Fulfillment -> E-satisfaction	0.589***	Not rejected
H6	Fulfillment -> E-trust	0.466***	Not rejected
H7	Privacy -> E-satisfaction	0.061	Rejected
H8	Privacy -> E-trust	0.267***	Not rejected
H9	E-trust -> E-satisfaction	0.412***	Not rejected
H10	E-trust -> loyalty	0.553***	Not rejected
H11	E-satisfaction -> Loyalty	0.236***	Not rejected

***significant at alpha 1%, **significant at alpha 5%, *significant at alpha 10%

χ^2= 667.252, *df*= 258 (*p*-value= 0.000), GFI=0.847, AGFI=0.807, NFI=0.889, CFI=0.928, TLI=0.916, IFI=0.929, RMSEA=0.072, RMR=0.039.

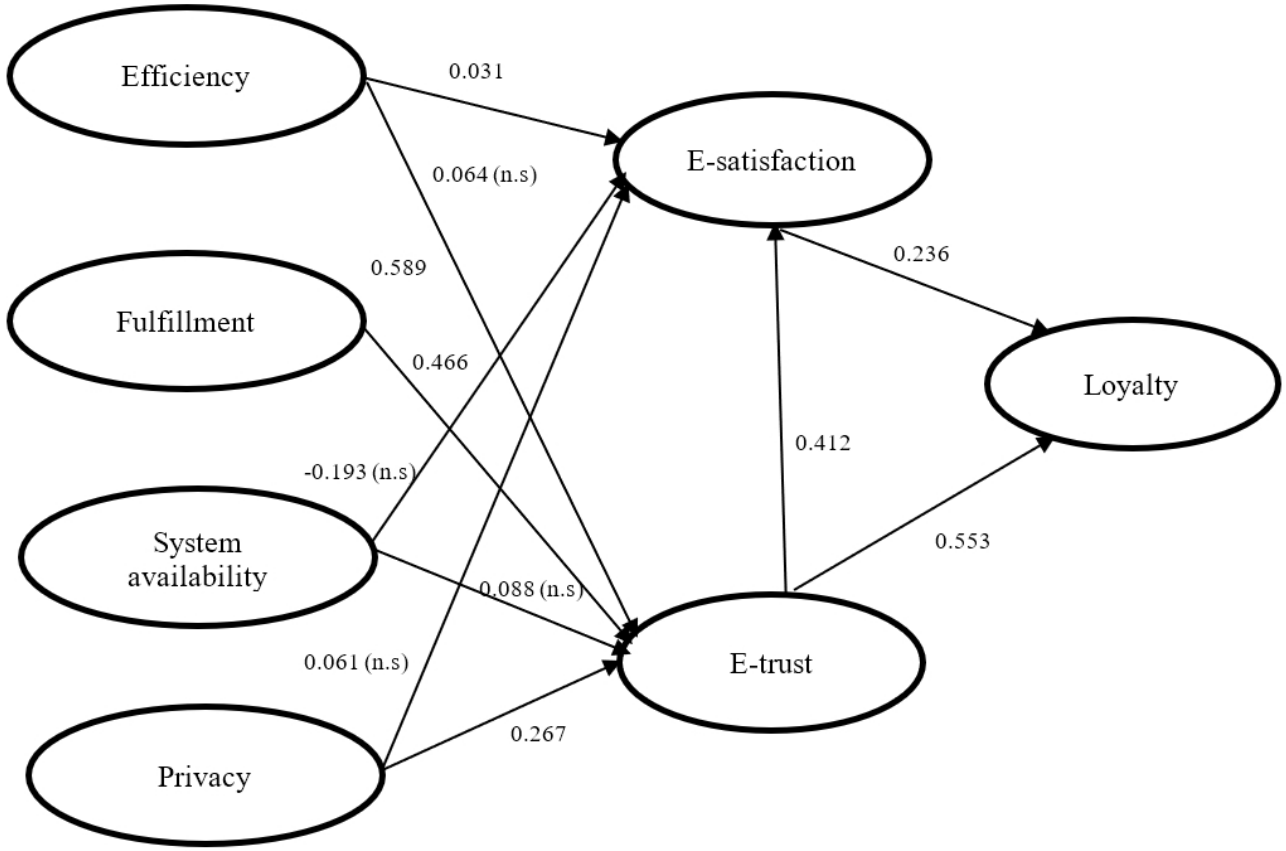
Table 2: Path coefficients

Furthermore, the effect of e-trust on e-satisfaction is supported by prior studies (H9). E-trust is significantly affected by e-satisfaction in a positive way (β=0.412). This finding is consistent with the studies of Jin and Park (2006) and Kim, Jin and Swinney (2009). Finally, e-trust and e-satisfaction significantly affect loyalty (H10 and H11). The effects of both variables on loyalty are significantly positive (β=0.553 and β=0.236, respectively). This finding offers support to the prior studies of Anderson and Srinivasan (2003), Pitta, Franzak, and Fowler (2006), and Kim, Jin, and Swinney (2009).

Grabner-Kräuter and Faullant (2008) acknowledged that technology is an object of trust. Trust is desired to build consumer loyalty. The smaller the consumer's perception of risk, the higher consumer loyalty. In the context of this study, e-trust is measured in the form of students' trust in all information provided, and all information is intended to facilitate students in their activities at the universities. E-trust has nothing to do with individual financial data that is shared through online sites as discussed in most of the similar studies on online shopping sites, e-banking or e-government. The quality of information shared by universities is a critical factor, not only for students but also for society. Kumar and Jumnal (2015) revealed that universities' web sites, portals and social media had replaced traditional management and promotion ways, especially with the emergence of internationalization of HEI. Florez-Parra, Perez, and Hernandez (2014) and Saraite-Sariene, Rodríguez, and de Rosario (2018) proclaimed that consistency, transparency, and information accountability had become crucial problems in HEI. Universities, especially state universities often have problems with disclosure information because the decision making is carried out internally. The potential disclosure information can occur in terms of strategies, financing, student and staff selections, remuneration, and university's ranking. Crawford (2012) asserted that information such as student registration statistics and facilities provided by universities must be reported transparently through web sites and by the actual situation. Student trust in all information shared will affect student loyalty to the university. Loyalty in this study is not limited to loyalty to the university's online sites (e-loyalty) but loyalty to the university as a whole. Loyalty is tested in the form of spreading positive information, reducing complaints and not seeking alternative education at other universities.

The importance of web sites, portals and social media have brought the online site as one of the university's competitive advantages (Lee, Choi, and Jo, 2009). Student loyalty to the university is strongly affected by their satisfaction with

online sites. The results of this study provide theoretical and managerial impacts. Theoretically, the results of this study contribute to the literature by analysing the relationship of e-service quality through the E-S-QUAL dimensions with e-satisfaction, e-trust and loyalty to the university. The empirical studies regarding the relationship between these variables at the university are still limited. Managerially, the strong effect of fulfilment on e-satisfaction suggests the decision-makers focus on aspects such as the ease of students looking for information they need, the quality and the way of information presented, design and layout, and updating information. The ability to fulfil those criteria will lead to e-satisfaction, e-trust and student loyalty to the university.



n.s.= non significant effects

Figure 1: Test results of the research model

CONCLUSIONS AND STUDY LIMITATIONS

In summary, from the four E-S-QUAL dimensions, efficiency and fulfilment are the only dimensions that affect e-satisfaction while fulfilment and privacy are the only dimensions that significantly affect e-trust. Fulfilment is the main predictor of e-service quality that affects e-satisfaction and e-trust. Moreover, the relationships between e-trust, e-satisfaction and loyalty are positively confirmed and offer support to the prior studies. The findings of this study are useful for decision-makers at the university regarding the importance of online sites to create loyalty. The findings suggest the importance of increasing capacity and improving facilities related to universities' web sites, portals, and social media. Some limitations should be noticed in this study. First, this study only collects data from undergraduate students. Further studies are recommended to employ graduate students and other users as well, such as staffs and lecturers. Graduate students usually require access to online publications and databases; thus, they may access universities' web sites and university portals more often than undergraduate students. The similarity goes for staffs and lecturers, most of whom have accessed web sites and portals to report their performance periodically. Their perceived e-service quality may be different from undergraduate students. The other limitation is we do not cover a specific indicator of ease of reading, ease of understanding content as well as the language provided by websites and portals. Besides, this study only examines the relationship of e-service quality, e-trust, and e-satisfaction on loyalty. Further studies should consider the comparison of effects with traditional service quality, trust, and satisfaction.

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