

THE INFLUENCE OF WEBSITE QUALITY ON E-LEARNING USAGE CONTINUITY

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ABSTRACT

This research is concerning on the influence of website quality on the continuity of e-learning usage. The researchers tested the positive influence of website quality on perceived value and the positive influence of perceived value on the intention to continuance intention to use e-learning to answer the research question. The online questionnaire is distributed to the research sample, 48 lecturers who are online course creator and active users of e-learning, to gather meaningful information for the analysis. Further, data analysis is conducted by using Partial Least Square (PLS). Research result suggests that all hypothesis is proven. Website quality has a positive influence on the perceived value (H1) with P-value 0.000. Also, perceived value is proven to have a positive influence on continuance intention to use e-learning with P-value 0.000. In conclusion, website quality has a positive influence on e-learning continuance intention.

Keywords: Website Quality, Perceived Value, Intention to Continue the Use of E-Learning

1. INTRODUCTION

In the past ten years, there has been a positive trend in the development of global internet usage [1-6]. APJII, an Indonesian association of internet service providers, surveyed internet users in Indonesia in 2016 and found that 93,8% of them have been using the internet to access educational content [7]. The finding signals that information technology and the internet has influenced life in general and education in many ways.

Internet and technology usage in education results in the invention of new learning media and system, such as e-learning. E-learning is one of the most promising and developing issues in the education sector [8]. E-learning is described as an internet-based learning resource [9] utilized to distribute independent content and conduct long-distance learning [10]. E-learning enables the users to access the material any time and anywhere and also allows the teacher to enrich the materials with various multimedia sources in an instant and a real-time manner [11].

E-learning serves competitive advantage for the learning process and has been developed vastly. Indonesia is currently ranked eighth in the world, in the development of e-learning adoption with the 25% growth rate, which is above ASEAN average e-learning adoption rate (17.3%) [12]. Previous researchers studied factors affecting continuance intention to use e-learning by adapting DeLone and McLean [13] model of information system success. Chiu, Hsu [14], Chang [8], and Dreheeb, Basir [15] suggested satisfaction as the mediator of the

2. LITERATURE REVIEW & HYPOTHESES DEVELOPMENT

2.1 *Model of Information System Success*

The evaluation of information system success is focusing on the advantage earned from the adopted system. In its early development in the 1980s, research focused on quality of the system and information in connection with users' satisfaction and impact on the individual as well as the organization. The sample of previous research is Alavi and Henderson [16], Ginzberg [17],

Raymond [18], and Sanders and Courtney [19]. Unfortunately, they have not been able to put a specific measurement on the success level.

In the early 1990s, DeLone and McLean [20] introduced six dimensions to measure information system success including system quality, information quality, information system usage, users' satisfaction, individual impact and organizational impact. The six dimensions are later used to construct an applicative and straightforward model.

Seddon [21] criticized DeLone and McLean [20] model by scrutinizing on the logical process and causal relationship in the model. Seddon [21] suggested an alternative model focusing more on the causal aspect of relation among taxonomy categories and separating it from information system success and behavior causal model resulted from information system success. Seddon success model includes three variables: (1) measurement of information and system quality; (2) measurement of perceived satisfaction and usefulness; (3) measurement of other information system usefulness.

DeLone and McLean [13] proposed a revised model on information system success and evaluate its usefulness in more extensive use of information system especially in the development of e-commerce. They agreed on Seddon [21] that unification of causal model and process would confuse people. However, they argued that the formula proposed by Seddon [21] be considered a complicated success model and shifted the primary purpose of the original proposed model.

DeLone and McLean [13] suggested a revised information system success model by adding service quality dimension as a new dimension to measure information system success and categorize the individual and organizational impact to one net dimension. Considering a voluntary basis in deciding the system application, DeLone and McLean [13] remained using system use and intention development dimension as the essential dimensions in measuring success.

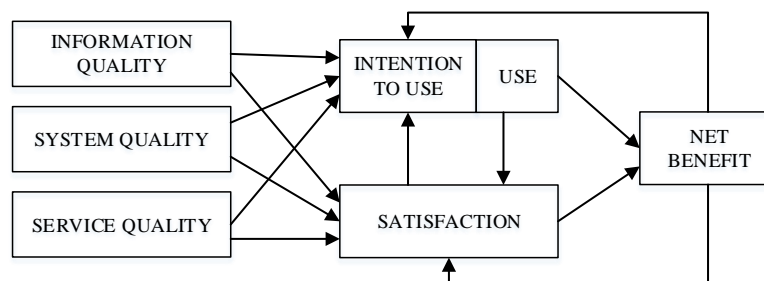


Figure 1: Success Model of DeLone and McLean [13]

2.2 Website Quality, Perceived Value, and Continuance Intention

Information system (website) quality consists of three main constructs including system quality, information quality and service quality [13]. In the context of website quality, Kuan, Bock [22] defined system quality as the degree to which the user's belief that the website is easy to navigate and able to interact consistently. Meanwhile, information quality is defined as the degree to which the user's belief that information provided in the website owns content attribute, preciseness, time format and preciseness. Lastly, service quality is defined as the degree to which the user's belief that the website is responsive, interactive, provide safety and protection to privacy, and effective in searching and comparing information.

Seddon, Kiew [23] and Chang [8] tested the influence of system quality on the perceived value found a positive relationship between them. Saeed and Abdinnour-Helm [24] and Chang [8] tested the relationship between information quality and perceived value and found a similar positive relationship between them. Furthermore, other research also found that service quality is significantly affecting perceived value [8, 25].

Perceived value is defined as the aggregate valuation on consumers' perception on the use of product and services based on what they received and gave [26]. Perceived value acts as the direct antecedent of continuance intention to use e-learning and positively influences continuance intention to use e-learning [8]. Based on discussed theories, this research proposes two main hypotheses as follows:

H1: Website quality positively influence perceived values

H2: Perceived value positively influence continuance intention to use e-learning

3. METHOD

3.1 Sample

The research sample includes lecturers using e-learning in their teaching. To determine the minimum amount of sample, the researchers use power analysis approach assisted with G*Power 3.1.2 software [27]. Furthermore, A-priori power analysis for fixed model multiple regression is implemented. In detail, the predictor of single coefficient amounts to 6, error prob 0,05 with impact size medium as much as 0.15 (0,02 small; 0, 15 medium and 0,35 large) [28] and power amounts to 0,08 [29]. Based on the analysis result, it is determined that the amount of minimum sample needed is 43. The questionnaire is distributed online to the whole population (150 lecturers). The online survey is chosen for several reasons namely easy to complete and manage, able to include various questions for any subject and provide a higher order of information as well as interactivity [30, 31]. Vu and Hoffman [32] argued that online survey has become one of the most popular methods in quantitative research due to its relatively low cost and high speed. From all of the spread questionnaire, there are 48 valid responses to be analyzed.

3.2 Variable definition and measurement

3.2.1. Continuance intention to use e-learning

Continuance intention is defined as the degree of users' intention to use e-learning system and willingness to recommend the system to others. Questionnaire design adopted form Chang [8] is used to measure the whole construct. Furthermore it is measured by using 5 points of the Likert scale.

3.2.2 Website Quality

Website quality consists of three main constructs, namely system quality, information quality and service quality [13]. Website quality is defined as the degree of process quality, output quality, and assurance quality wellness in e-learning. The constructs are measured by using questionnaire item introduced by DeLone and McLean [13] and modified by Chang [8]. In detail, the constructs are measured by using 5 points Likert scale.

3.2.3 Perceived Value

Perceived value is defined as an aggregate valuation on consumers' perception on the use of a certain product or service based on what they received and gave [26]. The constructs are measured by using questionnaire adapted from Chang [8]. In detail, it is measured by using 5 points Likert scale.

3.3 Validity and Reliability

Instrument's validity is tested by using convergent validity and discriminant validity. A construct is considered to fulfill convergent validity if its average variance extracted (AVE) is greater than 0.5 and has loading factor at least 0.60 or ideally 0.70 or more [29]. The convergent validity of this research used 0.60 loading value in the data analysis and has commonality value not less than 0.5. Furthermore, construct is considered to fulfill discriminant validity if the loading value between latent variable and its indicator is greater than the loading value between the particular indicator and other latent variable (cross loading). The result of cross loading test is provided in Table 1.

Tabel 1. Cross Loading

	Continuance Intention to Use	Perceived Value	Website Quality
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ICU1	0.9293	0.6453	0.5504
ICU2	0.9359	0.5425	0.5728
ICU3	0.8724	0.4161	0.4129
IQ1	0.5615	0.6794	0.7539
IQ2	0.5738	0.4828	0.7019
IQ3	0.4403	0.5607	0.7786
IQ4	0.2293	0.5506	0.6953
IQ5	0.5500	0.6280	0.8466
IQ6	0.4578	0.6258	0.8033
PV1	0.4070	0.8197	0.6737
PV2	0.4499	0.8237	0.5533
PV3	0.6040	0.7902	0.4922
ServQ1	0.2648	0.4235	0.6425
ServQ2	0.2488	0.4781	0.7453
SysQ1	0.5144	0.3475	0.6063
SysQ2	0.3208	0.2827	0.6201
SysQ3	0.2612	0.4305	0.7414
SysQ4	0.4525	0.4054	0.6896

Tabel 2. Validity and Reliability Test

	Cronbach's Alpha	rho_A	Composite Reliability	AVE
Continuance Int. to Use	0.9018	0.9403	0.9375	0.8335
Perceived Value	0.7404	0.7406	0.8524	0.6582
Website Quality	0.9162	0.9289	0.9284	0.5215

Instrument reliability is tested by calculating Cronbach's alpha and rho alpha. An instrument is considered valid if its Cronbach's alpha is higher than 0.7 and its rho alpha is higher than 0.7 [33]. Table 2 displays the result of validity and reliability test. Based on Table 2, all criteria of validity and reliability have been fulfilled.

3.4 Research Model and Hypotheses Testing

In this research, the hypotheses testing is conducted by using Partial Least Square (PLS) approach. To assist the hypotheses testing, PLS Smart 3.2.7 developed by Ringle, Wende [34] is used. Ho, Ang [35] mentioned that using PLS will provide an advantage to the researchers since it can estimate the size of a validity and reliability model measurement. Also, by using the indicator of the latent construct, PLS can produce a parameter for a structural model to measure the strength of hypothesized relation. Furthermore, hypotheses are tested by using bootstrapping function. The significance can be measured by comparing the value of t-statistic and t-table. Meanwhile, the direction of the relation (positive or negative) can be seen in the original sample column [36]. Figure 2 provides a clear picture of theoretical framework and hypothesis testing model.

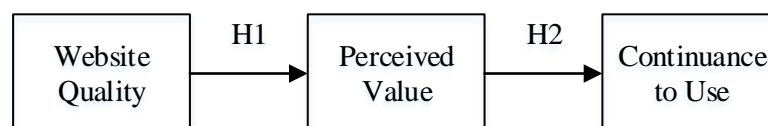


Figure 2: Theoretical Framework

4. RESULTS

4.1 Respondent's Description

There is a fair distribution of respondents' gender in this research in which the average age is

36.32 years old. Also, on average the respondents have been using e-learning as part of the learning process for 4.09 years. Table 3 provides detailed information regarding respondent's demography.

Tabel 3. Respondent's Demography

Panel A				
	Amount	Percentage		
Male	26	54%		
Female	22	46%		
Total	48	100%		
Panel B				
	Minimum	Maximum	Mean	Std. Dev.
Age (year)	25	63	36,31	9,47
Teaching Experience (year)	1	38	9,96	8,78
Experience in using e-learning (year)	1	18	4,09	3,76

4.2 Hypotheses Testing Result

Hypotheses testing is conducted by using Partial Least Square (PLS) approach to include all indicators and construct into one testing model. T-statistic and p-value are used to determine whether or not a hypothesis is supported. Furthermore, the nature of the relation can be determined by analyzing the value of the earned original sample. If the value is positive, it indicates a positive relation and vice versa. Based on the test's result, both H1 and H2 are supported (detailed information is provided in Table 4).

Tabel 4. Hypotheses Testing Result

		Original Sample	T Stat	P Values	
H1	Website Quality -> Perceived Value	0.6011	10.8380	0.0000	Supported
H2	Perceived Value -> Continuance Int. to Use	0.7078	5.5626	0.0000	Supported

5. DISCUSSION

This research is attempting on retesting the impact of website quality on continuance intention to use e-learning. Unlike the research conducted by Chang [8], this research is using course creators of e-learning having the authority and full access to use e-learning in their classes as the sample. In this case, the use of e-learning is based on a voluntary basis. Also, e-learning quality to support the success of learning process has a substantial impact on the decision to use e-learning. This research shows a positive relationship between e-learning website quality and perceived value. It indicates that website quality can improve the value of e-learning.

Naturally, an individual will tend to repeat a specific activity when he experiences value-added or finds an advantage in it. In the context of e-learning, users will remain using e-learning when they find it useful. The finding of this research provides support to Chang [8] that perceived value positively affects continuance intention to use e-learning.

Based on the research finding, it can be concluded that website quality can indirectly affect continuance intention to use e-learning. Website quality will influence continuance intention to use e-learning when the users can gain advantage from the website throughout the learning process. In other words, when the content and features of the website are unable to create value for the users, website quality is considered to be low and unable to influence the users to continue using it.

6. CONCLUSION AND FUTURE RESEARCH

The result of data analysis indicates that website quality positively influences perceived value

(H1) and perceived value positively influence continuance intention to use e-learning (H2). Further researchers can integrate other affecting factors into the model, such as technology readiness and external support. The two factors can influence information system acceptance and adoption [37, 38].

REFERENCES

1. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*. 2018, We Are Social.
2. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*. 2017, We Are Social.
3. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*. 2015, We Are Social.
4. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*, in *Digital in 2014*. 2014, We Are Social.
5. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*, in *Digital in 2013*. 2013, We Are Social.
6. Kemp, S., *We Are Social's Compendium of Global Digital, Social, And Mobile Data, Trends, And Statistics*, in *Digital in 2016*. 2016, We Are Social: Singapore.
7. APJII, *Data Statistik Pengguna Internet Indonesia 2016*. 2016: Indonesia.
8. Chang, C.C., *Exploring the determinants of e-learning systems continuance intention in academic libraries*. *Library Management*, 2013. **34**(1/2): p. 40-55.
9. Rezaei Sharifabadi, S., *How digital libraries can support e-learning*. *The Electronic Library*, 2006. **24**(3): p. 389-401.
10. DeGennaro, A.J., *Application of Multiple Intelligence Theory to an E-Learning Technology Acceptance Model*, in *Department of Information Science*. 2010, Cleveland State University: Cleveland. p. 251.
11. Surjono, H.D., *Modul Pelatihan: E-Learning Dasar*, T.P. UNY, Editor. 2013, Universitas negeri Yogyakarta.
12. Eka, R. *Melihat Tren E-Learning sebagai Komoditas Bisnis*. 2017 [cited 2018 15 March]; Available from: <https://dailysocial.id/post/melihat-tren-e-learning-sebagai-komoditas-bisnis>.
13. DeLone, W.H. and E.R. McLean, *The DeLone and McLean Model of Information Systems Success: A Ten-Year Update*. *Journal of Management Information Systems*, 2003. **19**(4): p. 9-30.
14. Chiu, C.-M., et al., *Usability, quality, value and e-learning continuance decisions*. *Computers & Education*, 2005. **45**(4): p. 399-416.
15. Dreheeb, A.E., N. Basir, and N. Fabil, *Impact of System Quality on Users' Satisfaction in Continuation of the Use of e-Learning System*. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 2016. **6**(1): p. 13-20.
16. Alavi, M. and J.C. Henderson, *An Evolutionary Strategy for Implementing a Decision Support System*. *Management Science*, 1981. **27**(11): p. 1309-1323.
17. Ginzberg, M.J., *Early Diagnosis of MIS Implementation Failure: Promising Results and Unanswered Questions*. *Management Science*, 1981. **27**(4): p. 459-478.
18. Raymond, L., *Organizational Characteristics and MIS Success in the Context of Small Business*. *MIS Quarterly*, 1985. **9**(1): p. 37-52.
19. Sanders, G.L. and J.F. Courtney, *A Field Study of Organizational Factors Influencing DSS Success*. *MIS Quarterly*, 1985. **9**(1): p. 77-93.
20. DeLone, W.H. and E.R. McLean, *Information Systems Success: The Quest for the Dependent Variable*. *Information Systems Research*, 1992. **3**(1): p. 60-95.
21. Seddon, P.B., *A Respecification and Extension of the DeLone and McLean Model of IS Success*. *Information Systems Research*, 1997. **8**(3): p. 240-253.
22. Kuan, H.-H., G.-W. Bock, and V. Vathanophas, *Comparing the effects of website quality on*

- customer initial purchase and continued purchase at e-commerce websites.* Behaviour & Information Technology, 2008. **27**(1): p. 3-16.
23. Seddon, P., M.-Y. Kiew, and M. Patry. *A Partial Test and Development of the DeLone and McLean Model of IS Success.* in *International Conference on Information Systems (ICIS)*. 1994.
 24. Saeed, K.A. and S. Abdinnour-Helm, *Examining the effects of information system characteristics and perceived usefulness on post adoption usage of information systems.* Information & Management, 2008. **45**(6): p. 376-386.
 25. Tam, J.L.M., *The Effects of Service Quality, Perceived Value and Customer Satisfaction on Behavioral Intentions.* Journal of Hospitality & Leisure Marketing, 2000. **6**(4): p. 31-43.
 26. Zeithaml, V.A., *Consumer perception of price quality and value: A means end analysis and synthesis of evidence.* Journal of Marketing, 52(3): 2–22., 1988. **52**(3): p. 2-22.
 27. Faul, F., et al., *Statistical power analyses using G*Power 3.1: tests for correlation and regression analyses.* Behavior Research Methods, 2009. **41**(4): p. 1149-1160.
 28. Cohen, J., *Statistical Power Analysis for the Behavioral Sciences* 1988: Lawrence Erlbaum.
 29. Chin, W.W., *Commentary: Issues and Opinion on Structural Equation Modeling.* MIS Quarterly, 1998. **22**(1): p. vii-xvi.
 30. Ilieva, J., S. Baron, and N.M. Healey, *Online Surveys in Marketing Research.* International Journal of Market Research, 2018. **44**(3): p. 1-14.
 31. Cobanoglu, C. and N. Cobanoglu, *The effect of incentives in web surveys: application and ethical considerations.* International Journal of Market Research, 2003. **45**(4): p. 475-488.
 32. Vu, P.H. and J. Hoffman, *Using Online Surveys in Vietnam An Exploratory Study.* International Journal of Market Research, 2011. **53**(1): p. 41-62.
 33. Dijkstra, T.K. and J. Henseler, *Consistent Partial Least Squares Path Modeling.* MIS Quarterly, 2015. **39**(2): p. 297-316.
 34. Ringle, C.M., S. Wende, and J.-M. Becker, *SmartPLS 3.* 2015, SmartPLS GmbH: Boenningstedt.
 35. Ho, V.T., S. Ang, and D. Straub, *When Subordinates Become IT Contractors: Persistent Managerial Expectations in IT Outsourcing.* Information Systems Research, 2003. **14**(1): p. 66-86.
 36. Hartono, J.M. and W. Abdillah, *Konsep & Aplikasi PLS (Partial Least Square) Untuk Penelitian Empiris.* 2009, Yogyakarta: BPFU UGM.
 37. Nugroho, M.A., *Impact of Government Support and Competitor Pressure on the Readiness of SMEs in Indonesia in Adopting the Information Technology.* Procedia Computer Science, 2015. **72**: p. 102-111.
 38. Nugroho, M.A. and M.A. Fajar, *Effects of Technology Readiness Towards Acceptance of Mandatory Web-Based Attendance System.* Procedia Computer Science, 2017. **124**: p. 319–328.