Factor Affecting E-Learning User Acceptance: A Case Study of AULA

Faried Effendy†, Octa Dwi Kurniawati, Guntung Priambada

Faculty of Science and Technology, Universitas Airlangga, Surabaya, Indonesia

*faried-e@fst.unair.ac.id

Abstract. E-learning is a strategy that is expected to transform ordinary learning into a learning philosophy that can be adapted, shared, reusable, and versatile. Based on previous research, e-learning acceptance is influenced by many factors. However, there are still some things that have not been determined and discussed; Therefore, they need further investigation. Based on previous assumptions, this study is an attempt to examine the factors that influence student acceptance of e-learning at Airlangga University, Indonesia. In this study, the Technology Acceptance Model (TAM) and (Information System) IS Success Model were combined to test intention, user satisfaction, and actual use of e-learning. This research was conducted by distributing online and offline questionnaires to 100 student respondents; then processed the data using SmartPLS 3.0. The results showed that e-learning user satisfaction was influenced by the quality of education, service quality, and information quality. At the same time, the intention to use is influenced by the quality of education. In addition, user satisfaction and intention to use e-learning affect the actual use of e-learning. This research is expected to help decision-makers from higher education to better understand the effectiveness of using e-learning by students.

1. Introduction

Teaching is the main activity of education, which involves lecturers as instructors and students as learning parties. As technology develops, teach and learn can be anywhere, any place, and any time. Virtual lecture technology, as widely known as e-learning, is a system or concept of learning that is structured to use an electronic system or computer so that it can support the learning process [1]. The widespread use of e-learning is consistent with the findings of research [2]; this shows that higher education students are more progressive and developed to use e-learning [3]. Users at the college level are also one of the things that triggered the development of the use of e-learning. Diverse e-learning services are available both independently managed through the Learning Management System (LMS) by institutions or freely provided by third parties. E-learning has a role in complementing conventional classes or face to face rather than replacing conventional classes [4]. E-learning increases the engagement and the quality of learning because it gives students the ability to communicate more with teachers and colleagues. The e-learning paradigm uses the internet to provide teaching materials and to create interactions between teachers and students [5].

The IS Success Model, and the Technology Acceptance Model (TAM) are two complementary elements. The IS Success model determines the success of an information system in an organization while TAM explains the acceptability of IT with specific dimensions that may influence user...
acceptability. TAM is one method that is widely used to measure the acceptance and use of technology. TAM is a theory that is considered the most relevant in predicting the desire and readiness to adopt the technology [6]–[8]. Much work on e-learning adoption was carried out on government-owned e-learning [1], [9]–[11], and universities [12]–[14]. Some studies conclude that e-learning is relevant and following user expectations, but others produce conflicting conclusions. This matter happens because the quality of technology is not the primary standard in the acceptance of e-learning technology but also depends on the content and the way of learning. In order to produce more useful research, the focus of the research needs to be changed; e-learning assessment should not do on the quality of the application only, but the content and design also. According to [15], system, quality, and information quality have a positive effect on e-learning system satisfaction, this is in line with the concept of the IS Success Model of Delone & McLean which suggests that system quality and information quality are expected to affect both usage and user satisfaction; further influences individual impact and organizational impact.

Several previous studies used the concept of the TAM and Information System Success Model to explore e-learning user behavior by considering the inhibiting and driving factors of an e-learning application [16]–[19]. Hassanzadeh [16] conducted an assessment of the e-learning system at the University of Iran by combining the TAM concept and the IS Success Model. The results showed that the use of the system, system loyalty, and goal achievement influenced by the quality of the technology system, the quality of the education system, the quality of content and information, the quality of service, user satisfaction, and intention to use. In another study, Lin [18] validates the E-Learning System of Satisfaction and Continuance Intention by combining the TAM and IS, the result of the studies have shown that the user’s satisfaction and intention to use is influenced by the quality of the program, the information on the website, and the information on the course. In this study, six factors from the previous study [17], [18] associate, and hypothesize to inspect user acceptance of Airlangga University Learning Application (AULA), which is Indonesian public university e-learning.

2. Research Methodology

In this model, 14 Hypotheses that will test shown in Figure 1, namely:

H1: Educational Quality (EQ) will affect Satisfaction (SAT)
H2: Educational Quality (EQ) will affect the Intention to Use (IU)
H3: Service Quality (SQ) will affect Satisfaction (SAT)
H4: Service Quality (SQ) will affect Intention to Use (IU)
H5: Technical System Quality (TSQ) will affect Satisfaction (SAT)
H6: Technical System Quality (TSQ) will affect the Intention to Use (IU)
H7: Information Quality (IQ) will affect Satisfaction (SAT)
H8: Information Quality (IQ) will affect the Intention to Use (IU)
H9: Perceived Ease of Use (PEU) will affect Intention to Use (IU)
H10: Perceived Ease of Use (PEU) will affect Perceived Usefulness (PU)
H11: Perceived Usefulness (PU) will affect the Intention to Use (IU)
H12: Satisfaction (SAT) will affect the Intention to Use (IU)
H13: Satisfaction (SAT) will affect Actual Use (AU)
H14: Intention to Use (IU) will affect Actual Use (AU)

In this study, primary data collection was conducted via online and offline questionnaires. The students were provided with an offline questionnaire while an online study was conducted by linking and disseminating a Google form using social media. The population selected in this study was Universitas Airlangga students who are using AULA. The sampling method used to determine the desired sample size of each batch is stratified random sampling. [21], [22] recommended ten times of the number of structural model pathways for the minimum sample size for the PLS-SEM application, because the number of structural research model pathways is 8, so $8 \times 10 = 80$ represents the minimum sample size needed to estimate PLS path models. Thus the number of samples determined by researchers is 100 respondents. Table 1 shows the details of the research sample.
3. Result and Discussion

The data processing technique of this study uses the PLS-SEM method. After the questionnaire data collected, it is tabulated to form an excel file and saved using the .csv (comma delimited) format. Stages of analysis using PLS is an evaluation of the structural model measurement and evaluation model.

1. Evaluate the measurement model
   a. Convergent Validity
      Convergent validity test depends on the value of loading factors found in the external loadings table and the AVE value. By definition, the loading factor is a significant correlation between indicators and latent variables. The weakest loading factor that can be accepted is 0.5. While the minimum AVE value recommended is 0.50. The results of data processing have no indicator and AVE, whose value is below 0.5; in other words, all indicators and AVE are valid. The results of the loading factors shown in Figures 2 and AVE value shown in Table 2.
   b. Discriminant Validity
      The discriminant validity can be tested by cross loading examination, which is the indicator correlation coefficient on the association construct (loading) compared to the correlation coefficient with other constructs (cross-loading). The output of cross-loadings shows that all indicators correlate with indicators with higher constructs than correlations with other constructs, so it means that the measurement model has good discriminant validity. The output of cross-loadings shown in Table 3.
   c. Composite Reliability
      The next test is to calculate the reliability of the indicator. The level of reliability is measured by the composite reliability value. Constructions are declared reliable if the composite reliability value is above 0.7. The composite reliability value is displayed in Table 4. Table 4 shows that all variables have composite reliability values above 0.7, so all variables are said to be reliable.

2. Structural Model Evaluation

Furthermore, testing is done on the structural model (inner model) to find out whether the hypothesis is accepted or rejected. In this study, the value $\alpha$ set to 5% or 0.05. If the p-value is $<0.05$, then H0 is rejected, meaning there is an influence. Conversely, if p-value $>0.05$, then H0 is accepted, meaning that there is no influence. The table shows the results of data processing for relationships between variables.

| Table 1. Demographic Information |
|----------------------------------|
| Values | Freq | Percentage |
|-------|------|-------------|
| Sex   |      |             |
| Male  | 35   | 35%         |
| Female| 65   | 65%         |
| Class of |     |             |
| 2015  | 35   | 35%         |
| 2016  | 30   | 30%         |
| 2017  | 35   | 35%         |
| Department |     |             |
| Mathematics | 30  | 30%         |
| Biology | 25   | 25%         |
| Physics | 20   | 20%         |
| Chemistry | 25  | 25%         |

Figure 1. Hypothesis model
Figure 2. Path analysis result

Table 3. AVE value

| Variable | AVE  |
|----------|------|
| AU       | 0.7999 |
| EQ       | 0.667  |
| IQ       | 0.661  |
| IU       | 0.763  |
| PEU      | 0.710  |
| PU       | 0.875  |
| SAT      | 0.712  |
| SQ       | 0.776  |
| TSQ      | 0.692  |

Table 4. Composite Reliability

| Variable | Composite Reliability |
|----------|-----------------------|
| AU       | 0.888                 |
| EQ       | 0.800                 |
| IQ       | 0.795                 |
| IU       | 0.865                 |
| PEU      | 0.830                 |
| PU       | 0.933                 |
| SAT      | 0.832                 |
| SQ       | 0.874                 |
| TSQ      | 0.818                 |

Table 5. Hypothesis result

| Hypothesis | p-values | Decision |
|------------|----------|----------|
| H1         | 0.001    | Accept   |
| H2         | 0.037    | Accept   |
| H3         | 0.032    | Accept   |
| H4         | 0.117    | Reject   |
| H5         | 0.291    | Reject   |
| H6         | 0.476    | Reject   |
| H7         | 0.001    | Accept   |
| H8         | 0.644    | Reject   |
| H9         | 0.3      | Reject   |
| H10        | 0        | Accept   |
| H11        | 0.761    | Reject   |
| H12        | 0.009    | Accept   |
| H13        | 0        | Accept   |
| H14        | 0        | Accept   |
4. Result Analysis

As can be observed in table 5, there are eight hypotheses accept and six rejected hypotheses. The first and second hypotheses (H1 and H2) observed that the conductive academic atmosphere in terms of collaborative learning has a positive impact on AULA user’s satisfaction and intention. In terms of H3 and H4, noted that the quality of services provided by AULA to users has been able to increase user satisfaction, but has not been able to increase their intended use. While for H5 and H6 observed that the characteristics and features of the AULA system have not been able to make users satisfied, and at the same time, cannot increase the user’s intention to use AULA. Seventh and eighth hypotheses (H7 and H8) describe that users are satisfied with the output characteristics and features of AULA, but these characteristics and features cannot increase the intention to use AULA. H9 and H10 examine the perceived ease of use effect on user intention and perceived usefulness. This test noted that free of effort that AULA gives to the students could not improve their intentions towards AULA. However, it has an impact on their confidence in using AULA. H11 and H12 evaluate the influence of PU and SAT on User intention. The test results concluded that user satisfaction would affect user intentions in using AULA, while Perceived usefulness does not have a positive effect on user intentions on AULA. Lastly, H13 and H14 result described that both satisfaction and user intention would affect actual use on AULA.

5. Conclusion

This study investigates user acceptance of AULA as e-learning used by Airlangga University students. The combination of the TAM IS Success model is used to examine intention, user satisfaction, and actual use on e-learning. The study observed that actual use is influenced by satisfaction and intention to use, while satisfaction is influenced by the educational quality, service quality, and information quality. On the other hand, the intention to use is influenced by educational quality. The users expect that AULA can improve the security system so that users are more satisfied and have more intentions to use AULA. Moreover, AULA is also expected to provide more responsive services, providing up-to-date content, and providing more effective and efficient services so that users have more intentions in the use of the AULA, which will have an impact on the actual use of the AULA.

References

[1] M. Esterhuysse and B. Scholtz. “The Intention to Use e-Learning in Corporations.” in International Conference on Information Resources Management (CONF-IRM). 2016. pp. 1–13. [Online]. Available: http://aisel.aisnet.org/confirm2016.

[2] H. Al-Samarraie. B. K. Teng. A. I. Alzahrani. and N. Alalwan. “E-learning continuance satisfaction in higher education: a unified perspective from instructors and students.” Studies in Higher Education. vol. 43. no. 11. pp. 2003–2019. 2018. doi: 10.1080/03075079.2017.1298088.

[3] T. Chuchu and T. Ndoro. “An Examination of the Determinants of the Adoption of Mobile Applications as Learning Tools for Higher Education Students.” International Journal of Interactive Mobile Technologies (iJM). vol. 13. no. 03. p. 53. 2019. doi: 10.3991/ijim.v13i03.10195.

[4] S. Sawang. C. Newton. and K. Jamieson. “Increasing learners’ satisfaction/intention to adopt more e-learning.” Education and Training. vol. 55. no. 1. pp. 83–105. 2013. doi: 10.1108/0040091311295031.

[5] S. Carliner and P. Shank. The e-Learning Handbook. 1st ed. San Fransisco: Pfeiffer A Wiley Imprint. 2008.

[6] M. Chuttur. “Working Papers on Information Systems Overview of the Technology Acceptance Model: Origins. Developments and Future Directions.” Working Papers on Information Systems. vol. 9. no. 2009. pp. 9-37. 2009. doi: 10.1021/jf001443p.

[7] M. G. Md Johar and J. A. Ahmad Awalluddin. “The Role of Technology Acceptance Model in Explaining Effect on E-Commerce Application System.” International Journal of Managing Information Technology. vol. 3. no. 3. pp. 1–14. 2011. doi: 10.5121/ijmit.2011.3301.
[8] P. Surendran. “Technology Acceptance Model: A Survey of Literature.” *International Journal of Business and Social Research*. vol. 2. no. 4. pp. 175–178. 2012.

[9] Ö. Sebetci. “A TAM-based model for e-government: A case for Turkey.” *International Journal of Electronic Governance*. vol. 7. no. 2. pp. 113–135. 2015. doi: 10.1504/IJEG.2015.069503.

[10] A. Nasrullah, M. Marlina, and W. Dwiyanti. “Development of student worksheet-based college e-learning through Edmodo to maximize the results of learning and motivation in economic mathematics learning.” *International Journal of Emerging Technologies in Learning*. vol. 13. no. 12. pp. 211–229. 2018. doi: 10.3991/ijet.v13i12.8636.

[11] I. K. Suartama, P. Setyosari, Sulthoni, and S. Ulfa. “Development of an instructional design model for flipped learning in higher education.” *International Journal of Emerging Technologies in Learning*. vol. 65. no. 2. pp. 427–453. 2017. doi: 10.1007/s11423-016-9502-1.

[12] T. Apriliana et al. “Investigating users’ perspectives on e-learning: An integration of TAM and IS success model.” *International Journal of Interactive Mobile Technologies (iJIM)*. vol. 13. no. 03. pp. 359–374. 2016. doi: 10.1016/j.chb.2014.07.044.

[13] F. S. Rahayu, D. Budiyanto, and D. Palyama. “Analisis Penerimaan E-Learning Menggunakan Technology Acceptance Model (Tam) (Studi Kasus: Universitas Atma Jaya Yogyakarta).” *Jurnal Terapan Teknologi Informasi*. vol. 1. no. 2. pp. 87–98. 2017. doi: 10.21460/jutei.2017.12.20.

[14] R. A. S. Al-Maroof and M. Al-Emran. “Students acceptance of google classroom: An exploratory study using PLS-SEM approach.” *International Journal of Emerging Technologies in Learning*. vol. 13. no. 6. pp. 112–123. 2018. doi: 10.3991/ijet.v13i06.8275.

[15] J. C. Roca, C.-M. Chiu, and F. J. Martínez. “Understanding e-Learning continuance intention: An extension of the Understanding e-learning continuance intention: An extension of the Technology Acceptance Model.” *International Journal of Human-Computer Studies*. vol. 64. no. 8. pp. 683–696. 2006. doi: 10.1016/j.ijhcs.2006.01.003.

[16] A. Hassanzadeh, F. Kanaani, S. Elahi, F. Kanaan, and S. Elahi. “A model for measuring e-learning systems success in universities.” *Expert Systems with Applications*. vol. 39. no. 12. pp. 10959–10966. 2012. doi: 10.1016/j.eswa.2012.03.028.

[17] H. Mohammadi. “Investigating users’ perspectives on e-learning: An integration of TAM and IS success model.” *Computers in Human Behavior*. vol. 45. pp. 359–374. 2015. doi: 10.1016/j.chb.2014.07.044.

[18] T. C. Lin. “Combining the TAM and IS Success Models to Validate E-Learning System Satisfaction and Continuance Intention.” *Advanced Research in Adult Learning and Professional Development: Tools. Trends. and Methodologies*. pp. 290–301. 2013. doi: 10.4018/978-1-4666-4615-5.ch013.

[19] A. K. M. N. Islam. “System Quality as Educators’ Motivation to Continue E-Learning System Use.” *AIS Transactions on Human-Computer Interaction*. vol. 4. no. 1. pp. 25–43. 2012.