

# EVALUATION OF E-LEARNING IMPLEMENTATION IN THE UNIVERSITY USING DELONE AND MCLEAN SUCCESS MODEL

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**Abstract:** The objectives of this study are to analyze lecturers' perceptions of the implementation of e-learning, evaluate the success of the implementation of e-learning, and analyze the factors that influence and lead to the successful implementation of e-learning in Faculty of ABC in XYZ University. This research used quantitative research. The population involved in this study was lecturers of the Faculty of ABC at XYZ University who implement e-learning. This study used Delone and McLean success model. Data analysis techniques used were descriptive and Structural Equation Modeling (SEM) SMART PLS 2.0. The sampling technique used was accidental sampling. This study involved 46 lecturers as the sample using Slovin's formula, with a significance level of 10%. Data were collected using questionnaires rated with a *Likert* scale. The results showed that lecturers' perceptions towards the implementation of e-learning were very good. The highest achievement in its application was found at the level of effectiveness and then followed by a semantic level and technical level. Factors that influence successful implementation of e-learning include information quality, use, and user satisfaction with e-learning systems implemented.

**Keywords:** Delone and McLean, e-learning



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Currently, along with the rapid development of Information Technology (IT) in the era of globalization, it requires good IT management. Management includes several stages, namely process, planning, organizing, and monitoring of data and infor-

mation that are useful in doing tasks for an organization; therefore, it is the definition of Management Information Systems (MIS). By using IT, it is easier for school management to process data and produce information that supports the needs of school management in making decisions (Susanto MH et al. 2015). The rapid development of IT has led to IT-based learning (education) to become an inevitable need. The concept of learning, which became

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known as e-learning, has an effect on the transformation process of education from conventional to digital, both in terms of content and system. E-learning is the use of digital devices, such as computers and mobile devices, to help learning and teaching activities Clark and Mayer (2011). E-learning is one of the utilization of information systems in learning management to build effective and efficient learning systems. Refer to Higher Education Law No. 12 of 2012, article 31 concerning Distance Education of Long-Distance Learning (PJJ), PJJ will provide higher education to groups of people who cannot attend face-to-face education; it also expands and facilitates access to higher education. According to Permendikbud No. 109 of 2013, the goal of PJJ is to equalize access to higher education by utilizing computer information technology in the form of an integrated learning program in colleges. Delone and McLean success model (2013) is simple but complete and has been widely used by researchers in developing their studies on the success of information systems (Urbach & Mueller 2011). According to Arsyhanur et al. (2019), Delone & McLean Model (2003) consists of six variables, namely: Information Quality, System Quality, Service Quality, Users, User Satisfaction, and Net Benefits.

Several studies have been conducted on the development and implementation of e-learning in the field of education, from the elementary level to higher education. Mutia I, Leonard (2013). Mousazadeh et al. (2016). The results of those studies showed

that overall, the benefits of e-learning include independence and individual satisfaction, learning anytime and anywhere, learning without prerequisites, saving time and money, as well as providing everyone opportunities to learn and teach. Tarus, Jhon. et al. (2015) recommended e-learning to State Universities in Kenya, based on the result of research at three state universities in Kenya, which show great benefits obtained from the use of e-learning in the learning and teaching process. Virtual learning model (e-learning) is a breakthrough in the field of teaching and learning because it can minimize differences in the way it teaches and material, thus providing a consistent quality standard of learning. Deny et al. (2018) measured the success of the implementation of e-learning at a university in Jakarta for 9 years using the Delone and McLean success model. The test was conducted by proposing eight research hypotheses; out of eight hypotheses, only two hypotheses show a significant influence. User satisfaction has a significant effect on the intensity of use. User satisfaction also has a positive effect on the university image. Romayah S et al. (2014) stated that it needs to improve Information Technology (IT), improve the quality and quantity of the IT field, as well as improve the quality of the system and information quality to support the implementation of e-Government.

In 2014, the Faculty of ABC at XYZ University used e-learning which was based on online media, namely Google Classroom. Ramadhani GD

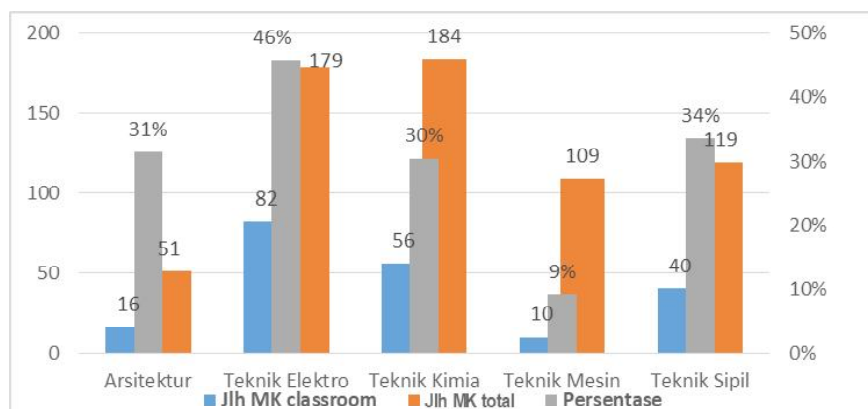


Figure 1 Amount of Courses Using E-Learning in Faculty of ABC Based on the Department

at al. (2017) stated that the Faculty of ABC has the most e-learning classroom users at XYZ University. The use of this model is based on the willingness of the lecturers so that the use of e-learning is not evenly distributed in each department in the Faculty of ABC. During 5 years of implementation, e-learning has never been evaluated. The distribution of e-learning at the Faculty of ABC at XYZ University is presented in Figure 1.

The objectives to be achieved in this study are to analyze lecturers' perceptions towards the implementation of e-learning, evaluate the success of the implementation of e-learning, and analyze the factors that influence the success of e-learning at the Faculty of ABC in XYZ University.

**METHOD**

This research is quantitative. This study was conducted at the Faculty of ABC at XYZ University. The population involved is lecturers who use e-learning in their learning and teaching process. The total population is 70 lecturers. The number of samples was determined using Slovin's formula, with a significance level of 10% (Lely HT et al. 2018). The results of the calculation of the number of samples to be used are as follows:

$$\begin{aligned} \text{Sample calculation } n &= \frac{N}{1 + N(\alpha)^2} \\ n &= \frac{70}{1 + 70(0,10)^2} \\ n &= 41 \end{aligned}$$

The sampling technique employed in this study was a probability sampling technique, while the sampling method used in this study was accidental sampling. Data collection was carried out using a questionnaire. The respondents filled out the questionnaire via Google Form. Researchers also conducted telephone interviews to obtain information related to this study. The data used in this study were primary data and secondary data. Primary data is the main data obtained from the questionnaires that had been filled out by the respondents. Secondary data is supporting data obtained from various research

sources, books, journals, articles, internet websites, the strategic plan of the Faculty of ABC at XYZ University, and sources related to research. The research questionnaire consisted of two parts, namely the respondent behavior and model. The model questionnaire used closed questions, and the responses were rated using the Likert scale. Respondents filled out the questionnaire and gave their assessment based on their perception towards the implementation of e-learning systems at the Faculty of ABC at XYZ University. Respondents' answers were processed using a Likert scale, from 1 to 5, in accordance with the experience of respondents regarding e-learning in the Faculty of ABC. The evaluation criteria are: 1 = Very bad, 2 = Not good, 3 = Pretty good, 4 = Good, and 5 = Very good.

Delone & McLean model and the development carried out by Lee Post in this study were used as a basis and reference in developing hypotheses in measuring the implementation of e-learning in Faculty of ABC in XYZ University.

Hypotheses developed in this study are as follows:

- H1 : Information systems may have a positive influence on the use.
- H2 : Information systems may have a positive influence on user satisfaction.
- H3 : System quality may have a positive influence on use.
- H4 : System quality may have a positive influence on user satisfaction.
- H5 : Service quality may have a positive influence on use.
- H6 : Service quality may have a positive influence on user satisfaction.
- H7 : Use may have a positive influence on use.
- H8 : Use may have a positive influence on net benefit.
- H9 : User satisfaction may have a positive influence on net benefit.

**RESULTS**

The Success of E-Learning was measured by Information Quality, System Quality, and Service Quality

The conditions of e-learning use in Faculty of ABC at XYZ University in terms of system quality and service quality are presented in Table 1

The success of the E-Learning System Employed in Faculty of ABC at XYZ University in terms of effectiveness.

**Table 1 The Conditions of E-Learning Use: Information Quality, System Quality, and Service Quality**

Variable	Indicator	Symbol	Mean	Loading Factor	Regression Score
Information Quality	Completeness	KI1	3.80	0.778	4.89
	Written clearly	KI2	3.91	0.788	4.97
	Understandable	KI3	4.09	0.820	4.98
	Up-to-date	KI4	3.89	0.806	4.83
	Accurate	KI5	3.89	0.889	4.38
	Safe	KI6	3.83	0.768	4.98
	Relevant	KI7	3.98	0.840	4.74
	Useful	KI8	4.33	0.855	5.06
System Quality	Adaptability	KS1	3.96	0.903	4.38
	Reliability	KS2	3.87	0.895	4.32
	Response time	KS3	3.83	0.884	4.33
	Easy to use	KS4	4.20	0.866	4.84
Service Quality	Guarantee	KL1	3.95	0.890	4.43
	Attention	KL2	3.76	0.887	4.24
	Responsiveness	KL3	3.67	0.887	4.14

The Success of E-Learning in Faculty of ABC at XYZ University was measured by system use,

user satisfaction towards the system, and net benefits. It is presented in Table 2 below:

**Table 2 The conditions of E-Learning Use: Use, User Satisfaction Towards The System, and Net Benefits**

Variable	Indicator	Symbol	Mean	Loading Factor	Regression Score
Use	Powerpoint	P1	4.28	0.739	5.80
	Audio/Video	P2	4,1	0.807	5.09
	Discussion Forum	P3	3.68	0.607	6.07
	Question Exercise	P4	3.87	0.714	5.42
	Excel Tutorial	P5	3.83	0.813	4.71
	Assignment	P6	4.04	0.832	4.86
User Satisfaction towards the System	Overall satisfaction	KP1	4.00	0.846	4.73
	Pleasant Experience	KP2	4.02	0.932	4.32
	Desire to reuse	KP3	4.17	0.887	4.71
Net Benefits	Skill improvement	MB1	4.11	0.800	5.14
	Empowerment	MB2	3.78	0.775	4.88
	Time-saving	MB3	4.39	0.790	5.56
	Cost-saving	MB4	3.91	0.774	5.06
	Academic achievement	MB5	4.30	0.781	5.51
	Overall success	MB6	3.78	0.705	5.37

Factors that Influence the Success of E-Learning Implementation at Faculty of ABC at XYZ University

Each relationship (hypothesis) in this study was tested using the bootstrapping of the study sample.

According to Hass and Lehner (2009), the path coefficient is considered insignificant if it is in the range of -0.1 to 0.1. The results of the hypothesis test for the direct influence of the research model are presented in Table 3 below.

**Table 3 Direct Influence of Information Quality, System Quality and Service Quality on The Use, User Satisfaction, and Net Benefits**

Relationship between indicator and variable	Hypothesis	Path coefficient	t-statistic	Note
Information Quality → Use	H1	0.352	2.255*	Significant
System Quality → Use	H2	0.378	1.982*	Significant
Service Quality → Use	H3	0.056	0.253*	Insignificant
Information Quality → User Satisfaction	H4	0.552	2.156*	Significant
System Quality → User Satisfaction	H5	0.094	0.557*	Insignificant
Service Quality → User Satisfaction	H6	-0.366	1.665*	Insignificant
Use → User Satisfaction	H7	0.189	0.900*	Insignificant
Use → Net Benefits	H8	0.395	3.535*	Significant
User Satisfaction → Net Benefits	H9	0.502	4.037*	Significant

\*Indicates a significant relationship

**Table 4 Indirect influence of information quality, system quality and service quality, use, and user satisfaction on the system**

Indirect effect relationship	Path coefficient 1	Path coefficient 2	Indirect Effect
Information Quality → Use → Net Benefits	0.352	0.395	0.139
System Quality → Use → Net Benefits	0.378	0.395	0.149
Information Quality → User Satisfaction → Net Benefits	0.552	0.502	0.277
Service Quality → User Satisfaction → Net Benefits	0.189	0.502	0.095
System Quality → Use → User Satisfaction	0.378	0.395	0.149
Service Quality → Use → User Satisfaction	0.056	0.395	0.022

**DISCUSSIONS**

The user’s perception of e-learning is very good, indicated by the respondents’ answers. One-third of the research variables showed an average score of above four, half of the research variables showed an average score of 3.96, and one variable showed an average score of 3.79. The success of e-learning at the Faculty of ABC was measured using the Delone and McLean success model. According to Delone and McLean, there are three measures of success in terms of technical level, specifically sys-

tem quality and the quality of e-learning services at the Faculty of ABC at XYZ University. The semantic level was measured by the information quality of e-learning at the Faculty of ABC at XYZ University. Success at the level of effectiveness of the system was measured through the use of the system, user satisfaction, and the net benefits obtained from the e-learning system at the Faculty of ABC at XYZ University.

### **The Success of E-Learning in Faculty of ABC in Technical Level (System Quality and Service Quality)**

The condition for e-learning implementation at the technical level as a whole is high-performance. Easy-to-use is an indicator that gives the greatest contribution to forming system quality. Meanwhile, response time is an indicator of the lowest contribution. The indicator with the highest contribution is easy to use, followed by adaptability, reliability, and response time. Based on the loading factor, easy to use is the indicator with the highest contribution. If you want to make improvements to system quality, the priority is adaptability, followed by reliability, easy to use, and response time. Overall, service quality is good. The guarantee is an indicator with the highest contribution, followed by attention and responsiveness; this is in accordance with the value of the loading factor of service quality. If improvement is required, then the order of priority increases through some indicators, namely guarantee, attention, and responsiveness. Therefore, it can be concluded that the implementation of e-learning at the technical level is successful.

### **The Success of E-Learning in Faculty of ABC in Semantic Level (Information Quality)**

Overall, the assessment of success on quality information is high. Two of the eight indicators show a very high score, namely useful and easy to understand. Accurate is an indicator that has the highest loading factor value. If improvement is required, the quality of information can be improved by improving several indicators, namely accurate, useful, relevant, and easily understood. It was concluded that the implementation of e-learning in the semantic level was successful.

### **The Success of E-Learning in Faculty of ABC in Effectiveness Level (Use, User Satisfaction, and Net Benefits of the System)**

Overall, the use of the system has shown good performance, while user satisfaction and net benefits of the system show better performance. In terms of the system use, out of six indicators used

in this study, three indicators have very high performance, namely PowerPoint, audio/ video, and task. An indicator that has the highest loading factor value is task/ assignment. In terms of user satisfaction, an indicator that obtained the highest satisfaction is reuse. Pleasant experience obtained high value, followed by overall satisfaction. The net benefits of the system are very high. Saving time is an indicator with the highest value, followed by academic success, and improvement in students' abilities. Based on the loading factor value improvement in students' abilities obtained the highest value. The results of descriptive analysis showed the success of e-learning implementation in the Faculty of ABC at XYZ University. The highest success was found in terms of effectiveness level, followed by the semantic level and technical level.

### **Factors That Influence the Success of E-Learning Implementation in Faculty of ABC at XYZ University**

Factors that directly influence and lead to the successful implementation of e-learning at the Faculty of ABC include information quality, system quality, and service quality. Out of nine hypotheses proposed in this study, five hypotheses show a significant influence, namely information quality on the use, and the system quality on the use, followed by information quality on user satisfaction, use on net benefits, and user satisfaction on net benefits. Based on the t-statistic value, user satisfaction has a very significant relationship with net benefits. This result is supported by research which was conducted by Cidral et al. (2018). Hudin et al. (2016).

Indirectly, user satisfaction with the implementation of e-learning in the Faculty of ABC can also be improved by improving information quality and system quality (indirect effect), through a variable of use. The highest improvement through the indirect pathway (use) is through system quality improvement → use → user satisfaction, followed by information quality → usage → user satisfaction.

The benefits of using e-learning in Faculty of ABC are in accordance with the function of the application of information systems management in the learning process, namely improving the efficiency

and effectiveness of learning, increasing productivity and saving learning costs, and improving the quality of human resources, especially in the use of learning technology. The achievement of the implementation of information system management is indicated by the high value of the indicators forming the net benefits of e-learning systems.

### **Managerial Implications**

Based on the three successive levels in the Delone and McLean success model, the results of this study showed that the implementation of e-learning in Faculty ABC was considered good. It should be maintained and improved. Improvement can be done by increasing the indicators forming system quality, namely indicator of adaptability, reliability, and response time. Improvement can also be made through indicators forming service quality, namely guarantee, attention, and responsiveness. Meanwhile, in information quality, improvement can be done by increasing the accurateness.

## **CONCLUSIONS AND RECOMMENDATIONS**

### **Conclusion**

1. Overall, user perception toward e-learning implemented in the Faculty of ABC at XYZ University is very good.
2. Based on the analysis, the implementation of e-learning in the Faculty of ABC at XYZ University was successful at all levels. In the users' opinion, effectiveness obtained the highest success among all levels, followed by the semantic level, and technical level.
3. The success of e-learning implementation, starting from the techniques, semantics, and effectiveness in the Faculty of ABC at XYZ University was influenced by determining factors, among others, the level of technical success is influenced by system and service quality. Meanwhile, the success at the semantic level was influenced by the quality of the e-learning information system at the Faculty of ABC in XYZ University and the indicators forming information quality. As for success at the level of ef-

fectiveness, it was influenced by the use of the system, user satisfaction with the system, and the net benefits of the system. The use of e-learning systems was influenced by information quality and system quality from the use of the system. User satisfaction with the system is influenced by the quality of information. Furthermore, the success of net benefits is influenced by the use of the system and user satisfaction with the e-learning system employed at the Faculty of ABC at XYZ University. The success of the net benefits is also influenced by its forming indicators, such as time savings, cost savings, learning improvement, empowerment of abilities, academic success, and the perceived success of the entire system. Meanwhile, the factors that have indirect influence are information quality, service quality, and system quality.

### **Recommendation**

Improvement can be done by improving the system and information quality. The main priority is improving the level of e-learning implementation that can be done through serious attempts in improving system quality. This is because system quality has a higher direct effect on use compared to the effect of information quality on the use of e-learning at the Faculty of ABC. Moreover, in attempts to improve the e-learning process at the Faculty of ABC, it can be done by improving information quality. If user satisfaction with the system needs to be improved, then the information system should be improved as well. This is supported by the value of the direct effect of information quality, which is the highest among system and service quality.

### **REFERENCES**

- Assyanur R. M., et al. 2019. *Analysis of Success Factors Implementation of State Civil Apparatus Management Information System*. Jurnal Aplikasi Manajemen, Universitas Brawijaya Vo. 17 No.3 Tahun 2019.
- Cidral et al. 2018. *E-learning Succes Determinants: Brazilian Emperical Study*. Computers & Education 122 (2018)273-290
- Clark, C. R. and Mayer, E. R. 2008. *E-learning and the*

- Science of Instruction*. San Fransisco: Pfeiffer A Wiley Imprint.
- Delone and McLean 2003. *The DeLone and McLean Model of Information System Succes: A Ten-Year Update*. Journal of Management Information System/Spring 2003, Vol. 19, No. 4, pp. 9-30.
- Deny, Andry F. J. 2018. *Pengukuran Keberhasilan E-learning dengan Mengadopsi Model Delone & Mclean*. Jurnal Sistem Informasi Bisnis 01 (2018) [On Line]. From: <http://ejournal.undip.ac.id/index.php/jsinbis>.
- Mendikbud. 2013. *Peraturan Menteri Pendidikan dan Kebudayaan RI Nomor 109 Tahun 2013 Tentang Penyelenggaraan Pendidikan Jarak Jauh pada Pendidikan Tinggi*. Jakarta.
- Mousazadeh, Somayeh, Maryam Dehghani, Farzaneh Mozaffari, Seideh Madineh Ghasemnegad, Hamideh Hakimi, and Bagherian Samaneh. 2016. *The effectiveness of E- learning in learning: A review of the literature*. International Journal of Medical Research & Health Sciences, 2016, 5, 2:86-91
- Mutia dan Leonard. 2013. *Kajian Penerapan E-Learning dalam Proses Pembelajaran di Perguruan Tinggi*. Faktor Exacta 6 (4): 248-289, 2013 ISSN: 1979-276X
- Ramadhani G. D. dan Rummyeni. 2017. *Comunication Effetiveness of Online Media Google Classroom in Supporting The Teaching and Learning Process at Civil engineering University of Riau*. Journal Online Mahasiswa Fakultas Ilmu Sosial dan Ilmu Politik Universitas Riau. Tahun 2017.
- Romayah et al. 2014. *Evaluasi Implementasi E-government di Instansi XYZ*. Jurnal Aplikasi Manajemen Universitas Brawijaya Vol. 12, No. 4 tahun 2014.
- Setneg. 2012. *Undang-undang Republik Indonesia No 12 Tahun 2012 Tentang Pendidikan Tinggi*. Jakarta.
- Susanto M. H., Mantja W., Bafadal I., Sonhadji A. 2015. *Pengembangan Sistem Informasi Manajemen Pendidik dan Tenaga Kependidikan*. Jurnal Pendidikan Humaniora Vol.3 No.2 Hal 93-105, Juni 2015.
- Tarus, Jhon, Gichoya, Prof, and Muummbo, Alex. 2015. *Challenges of Implementing E-Learning in Kenya: A Case of Kenyan Public Universities*. <http://www.irrodl.org/index.php/irrodl/index.16.10.19173/irrodl.v16i1.1816>
- Urbach Nils and Mueller Benjamin. 2011. *The Updated DeLone and McLean Model of Information Systems Success*. <https://www.researchgate.net/publication/226710735>