pISSN: 2442-3386 eISSN: 2442-4293
Vol 9 No 2 Jul – Des 2023, 113 - 122
Melek IT
INFORMATION TECHNOLOGY JOURNAL

ANALYSIS OF SATISFACTION AND USEFULNESS OF LEARNING MANAGEMENT SYSTEM (LMS) USING EUCS AND TTF METHODS

Yana Shintya[1], Roby Darmadi*[2]
[1]Asa Indonesia University, Information System
[2]Asa Indonesia University, Information Technology
yana@asaindo.ac.id[1], robydarmadi@asaindo.ac.id*[2]

Abstract

Student satisfaction with using the Learning Management System (LMS) is one factor determining the achievement of bold learning objectives in tertiary institutions. This study aims to test the satisfaction and usefulness of LMS for students in learning to dare to use several variables in End User Computing Satisfaction (EUCS) and Task Technology Fit (TTF). The relationship between variables in EUCS and TTF was tested using the Structural Equation Model (SEM) based on 184 respondent data obtained from students using Moodle LMS at a university in Jakarta. The study's results revealed that the variable task characteristics and technological characteristics significantly affected TTF and EUCS tasks, and TTF positively affected EUCS. The results of the study provide recommendations that the resolution of LMS technology and the ease of use of LMS are the dominant factors influencing student satisfaction in using LMS.
Keywords: *Learning Management System, Task Technology Fit, End User Computing System, Online Learning.*

I. INTRODUCTION

The university's education processes have gained experience in implementing ICT for teaching and learning since the COVID-19 pandemic. In 2019, only 54 institutions under the supervision of the Director General of Higher Education used the Learning Management System (LMS) SPADA Indonesia for their educational activities, and only 53 study programs held face-to-face lectures mixed with online lectures (blended learning). In 2020, the COVID-19 pandemic hit the world, forcing all universities to utilize online learning models in their teaching and learning processes. Online learning (e-learning) provides two interaction models between teachers, lecturers, and students: synchronous and asynchronous. The synchronous learning model allows direct online interaction between lecturers and students, and the interaction can be in the form of video, voice, text messages, or a combination of all these things. At the same time, the asynchronous model is an interaction or communication that is established with a delayed time. The ability to use technology and student absorption during the learning process will greatly determine student satisfaction and will ultimately affect the success of the online learning model. Teachers must be able to utilize various media and interaction models in this online class.

Student satisfaction in using LMS in online learning will affect the motivation and success rate of learning goals set by universities. Widely used methods such as the EUCS and TTF methods are used to measure satisfaction using IT-based systems. EUCS measures information system user satisfaction by comparing the reality and expectations of information systems (Doll & Torkzadeh, 1988). However, TTF is an information system evaluation model based on a causal chain structure between information technology and performance. TTF is also a subset of behavioral theory used to study the process of adoption of information technology by end users (Goodhue & Thompson, 1995a)

Ahmed & Kader (2017), Ambra et al. (2013), and Oliveira et al. (2014) demonstrated that these three factors significantly influence task-technology fit. However, Yadegaridehkordi (2016) showed that task characteristics do not affect task technology. Goodhue & Thompson's (1995) studies show that TTF significantly affects individual performance. Several related studies have also shown that the suitability of TTF affects a person's efficiency when using information technology (Ambra et al., 2013; McGill & Klobas, 2009).

Several previous research studies to measure the level of satisfaction with using EUCS and TTF method computer systems are still carried out partially and provide inconsistent results. This study aims to test student satisfaction with LMS as a computer system in online learning using two methods, namely EUCS and TTF.

For Learning and Performance students, a web-based program called an LMS controls the learning content, student engagement, tool appraisal, and progress reporting (Nasser et al., 2011; Srichanyachon, 2014). Students can view and engage with learning using a web browser on any computer or mobile device by accessing online learning content through an LMS. A learning system, course management system, content management system, portal, and instructional management system are also included in the LMS (Coates et al., 2005). According to Riad (2009), an LMS is an integrated software full of Various

Delivery-related functions and management Courses. LMS automatically Manage functions to catalog courses, course delivery, assessments, and quizzes.

EUCS is an application that measures user satisfaction, comparing information system expectations and reality based on system user experience (Doll & Torkzadeh, 1988). Doll & Torkzadeh (1988) also argue that there are five dimensions in EUCS: timeliness, content, ease of use, format, and accuracy. The content dimension is usually used to measure user satisfaction with system content. In addition, the content dimension consists of the functions and modules available to system users and the system-generated information. The system is evaluated to determine whether it provides information that satisfies users' needs. When the system gets input and converts it into data, the accuracy dimension measures the user's satisfaction with the accuracy of the data. System accuracy is measured by examining the number of incorrect outputs produced when processing user input and measuring the frequency with which errors or failures occur when processing data.

The format dimension gauges the level of user satisfaction with the aesthetics and appearance of the system user interface, the format of reports or data generated by the system, the attractiveness of the system user interface, and whether the system's appearance facilitates the system user interface and consequently has an indirect impact on user performance. The ease of use dimension is used to measure user satisfaction with the system's ease of use, such as entering data, processing data, and finding the information needed. The timeliness dimension measures user satisfaction with the system's timeliness in presenting or communicating the information users need. A just-in-time system can be classified as a real-time system, meaning that every user query or input will be processed immediately and the results will be displayed quickly without waiting.

TTF is a paradigm for evaluating information systems that create a link between information technology and performance. TTF is a behavioral theory used to study the end-user adoption process of information technology. The essence of the TTF model is formal construction, that is, the application of technical skills to the job's requirements, for example—information technology skills in supporting work. The TTF model is proposed to test a task's suitability and techniques used to improve its performance and use (Goodhue & Thompson, 1995).

The TTF model explains that information technology is only used if it has functions and benefits that support the activities of its users. This model demonstrates that performance improves when technology offers the necessary capabilities and support for the task. Performance effects refer to individual achievements and tasks. High performance affects improved performance, efficiency, and quality (Goodhue & Thompson, 1995).

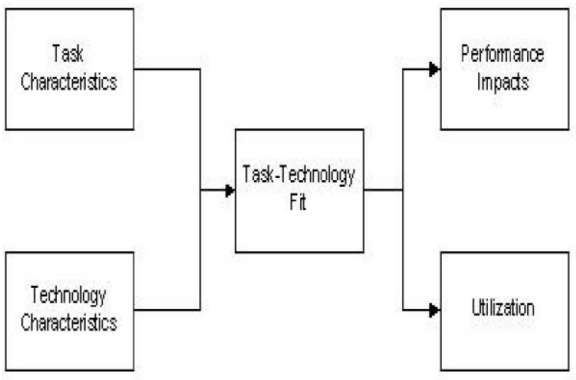

Figure 1. Task-Technology Fit
(Goodhue & Thompson, 1995)

Users are eager to use technology if the technology can improve the performance of its users. When a technology is suitable for a job, it is considered high quality and easy to use (Goodhue & Thompson, 1995). Based on the literature mentioned above review summary, the conceptual framework of this research is as follows:

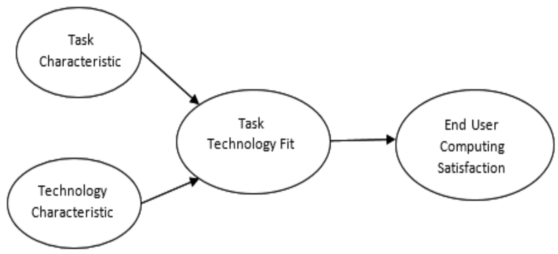

Figure 2. Research Framework

H1: Task Characteristic considerable impact on TTF

H2: Technology Characteristics have a considerable impact on TTF

H3: TTF Considerable Impact on EUCS

H4: Task Characteristic has a considerable impact on TTF and a considerable impact on EUCS

H5: Technology Characteristics have a considerable impact on TTF and a considerable impact on EUCS

II. METHODOLOGY

2.1 Respondents Characteristics

Table 1 shows the characteristics of respondents in this survey, which were classified by gender, age, and current semester:

Table 1. Characteristics of Respondents

Criterion	Information	Frequency	Percentage (%)
Gender	Woman	121	65,8%
	Man	63	34,2 %
Age	< 20 Years	8	4,3%
	20-30 Years	176	95,7%
Semester	Sem. 1	0	0%
	Sem. 2	0	0%
	Sem. 3	0	0%
	Sem. 4	1	0,5%
	Sem. 5	1	0,5%
	Sem. 6	65	35,3%
	Sem. 7	2	1%
	Sem. 8	115	62,5%

Source: Primary Data processed (2023)

From the data in Table 1, it can be seen that 65.8% of respondents are primarily female, and most of them are in the age range of 20-30 years, with a percentage of 95.7%. Most respondents who filled out the questionnaire were final-year students, which was 62.5%.

2.2 Measurement Model (Construction Validity & Reliability)

The first requirement is internal consistency in evaluating a measurement model by measuring the objects and variables observed. Latent constructions describe an absolute correlation more significant than 50% (Chin, 1998). Results of PLS analysis between Task Characteristic to TTF, Technology Characteristic to TTF, and TTF to EUCS.

Composite reliability and Cronbach's alpha both show construct-level reliability. Table 2 demonstrates that composite reliability exceeds the cut-off value of 0.70, while Cronbach's alpha exceeds the recommended threshold of 0.6 (Cronbach, 1951). Convergent validity is used to assess the relationship between product and construct scores. The higher the correlation, the more reliable the data. In other words, object laws must have the same fundamental structure as determined by unidimensionality (Henseler et al., 2009). Validity was tested in this study using the AVE (Average Variance Extracted) technique that has been established in general. The mean-variance extracted (AVE) for each latent variable is more than the suggested threshold of 0.5 (50%), indicating that each mean construct can account for more than half of the variance of the item it measures (see Table 2) (Fornell & Larcker, 1981).

Table 2. Validity, consistency, and internal convergence

Factors / Item	*Factor Loading*	*Cronbach's Alpha*	*Composite Reliability*	*Average Variance Extracted (AVE)*
Task Characteristic		0,874	0,923	0,799
X1-1	0,894			
X1-2	0,883			
X1-3	0,905			
Task Technology Fit		0,877	0,924	0,802
X2-1	0,909			
X2-2	0,915			
X2-3	0,849			
Technology Characteristic		0,871	0,921	0,795
X3-2	0,906			
X3-3	0,886			
X3-5	0,894			
End User Computing Satisfaction		0.886	0,917	0,689

Factors / Item	*Factor Loading*	*Cronbach's Alpha*	*Composite Reliability*	*Average Variance Extracted (AVE)*
Y1	0,87			
Y2	0,834			
Y3	0,851			
Y4	0,842			
Y7	0,747			

Source: Primary Data processed 2023

2.3 Measurement of discriminant validity

The validity of the discriminant describes the actual strength of one construct compared to another. Fornell Larcker was the first criterion for discriminant validity to be established. The square root value of the AVE construct must be bigger than the intercorrelation value of each construct in this process. Its construct must represent more variance with other components than the model. As demonstrated in Table 2, the square root of AVE is bigger than the related intercorrelation for all components. As a result, the measurement model's validity and reliability estimations are adequate.

Table 3 Discriminant Validity

Factors	End User Computing Satisfaction	Task Characteristic	Task Technology Fit	Technology Characteristic
End User Computing Satisfaction	0,830			
Task Characteristic	0,867	0,894		
Task Technology Fit	0,838	0,866	0,896	
Technology Characteristic	0,880	0,877	0,862	0,892

Source: Primary Data processed 2023

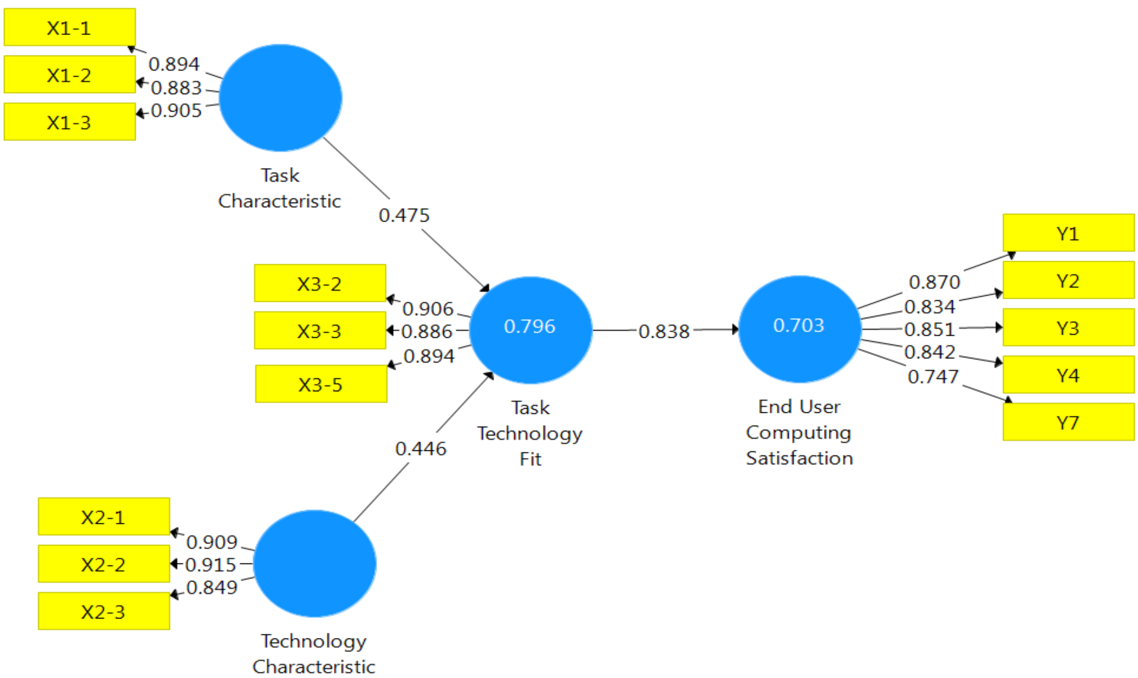

Figure 3. Structural Model (Bootstrapping with inner t-values)

pISSN: 2442-3386 eISSN: 2442-4293
Vol 9 No 2 Jul – Des 2023, 117 - 122
Melek IT
INFORMATION TECHNOLOGY JOURNAL

According to Table 3, the greatest value for the End User Computing Satisfaction variable is 0.830, the Task Characteristic variable is 0.894, the Task Technology Fit variable is 0.896, and the Technology Characteristic variable is 0.892. Based on Table 4.5, it can be seen that each indicator has the highest value of the latent construct loading factor tested compared to other latent constructs. Therefore, the validity of the discriminant can be said to be valid. Matrix cross-loading is another approach researchers use to test discriminant validity. The load factor of the structure must be higher than that of other structures. This shows that the building is valuable to the building in question (Straub & Gefen, 2004).

2.5 Coefficient of Determination (R2)

R-squared is a description of variants described by endogenous constructs. The coefficient of determination (R2) is essential in evaluating structural models (Klarner et al., 2013). The R-square value has three grouping categories: the strong category with a value of 0.75, the medium category with a value of 0.50, and the weak category with 0.25 (Hair et al., 2009).

Table 4 shows the results of R2 in End User Computing satisfaction is 0.703, and Task Technology Fit is 0.796. This result indicates that the R square Task Technology Fit value is included in the strong category because it is above the recommended 0.75 (Hair et al., 2009).

2.4 Structural Model Assessment

If the measurement model has been confirmed, the next step is to check the validity of the structural model evaluated based on, e.g., path coefficient, endogenous variable determination coefficient (R2), effect size (f2), predictive relevance (Q2) and multicollinearity (innerVIF)(Chin & Dibbern, 2010; Henseler et al., 2009). The minimum values and description of each proposed action are discussed below in the structural phase test.

Table 4. R- Square Results

	R Square	R Square Adjusted
End User Computing Satisfaction	0,703	0,701
Task Technology Fit	0,796	0,793

Source: Primary Data processed 2023

2.6 Effect Size (F2)

The magnitude of the effect is calculated using F2, where values between 0.00 and 0.15 indicate a small effect. In contrast, values between 0.16 and 0.35 indicate a moderate effect and values above 0.35 indicate a significant effect (Sarstedt et al., 2020). Table 5 shows that the task technology suitability variable has the most significant influence among other variables, namely 2,364.

Table 5. F- Square Results

	End User Computing Satisfaction	Task Characteristic	Task Technology Fit	Technology Characteristic
End User Computing Satisfaction				
Task Characteristic			0,254	
Task Technology Fit	2,364			
Technology Characteristic			0,224	

Source: Primary Data processed (2023)

2.7 Multicollinearity Results (Inner VIF)

VIF values more significant than ten and less than 0.1 indicate the presence of multicollinearity (Pallant, 2020). Based on the results in Table 4.8, this study obtained the most significant value of 4342 and the smallest value of 1000, indicating multicollinearity.

Table 6 Multicollinearity Result – Inner VIF value

	End User Computing Satisfaction	Task Characteristic	Task Technology Fit	Technology Characteristic
End User Computing Satisfaction				

Task Characteristic		4,342
Task Technology Fit	1,000	
Technology Characteristic		4,342

Source: Primary Data processed (2023)

2.8 Predictive Relevance (Q2)

In obtaining a predictive relevance model, a blind test is carried out to calculate the Q2 value. In general, the model specifies a good fit and higher predictability because the value of Q2 must be greater than 0, as shown in Table 7.

Table 7 Predictive Relevance Results

Variable Endogen	CCR (Q^2)	CCC(Q^2)
End User Computing Satisfaction	0,474	0,526
Task Characteristic		0,564
Task Technology Fit	0,630	0,571
Technology Characteristic		0,559

Source: Primary Data processed (2023)

2.9 Analysis of Direct and Indirect Effects (Path Coefficient)

The bootstrapping procedure calculates t-statistics and confidence intervals because PLS has no default distribution requirements (Chin, 1998). Table 8 shows the results of estimating path coefficients, where all proposed hypotheses are supported.

Table 8 Path Coefficient Result

Hipotesis	*Original Sample (O)*	*Sample Mean (M)*	*Standard Deviation (STDEV)*	*T Statistic*	*P Values*
Task Ch →TTF	0,475	0,469	0,099	4,799	0,000
Tech Ch→TTF	0,838	0,841	0,022	38,688	0,000
TTF→EUCS	0,446	0,452	0,102	4,358	0,000
Task Ch→TTF→EUCS	0,398	0,394	0,082	4,829	0,000
Tech Ch→TTF→EUCS	0,374	0,381	0,089	4,202	0,000

Source: Primary Data processed (2023)

The Influence of Task Characteristics on TTF

Based on the findings of the investigation in Table 8, a t-statistic value of 4.799 (>1.96) and a p-value (0.000) were obtained that met the requirements (<0.05), so it can be concluded that there is a significant favorable influence between Task Characteristics on TTF. This occurs in the influence of Task Characteristics on Technology and Task Conformity.

Task characteristics are one of the factors defined as actions that individuals take to convert inputs into outputs. Suppose the user participates in an independent task in his work using information technology. In that case, the user evaluates the application of technology in the performance of daily tasks (suitability of task technology) and the suitability of task characteristics and information technology, which will positively affect the TTF levels (Ahmed & Kader, 2017; Ambra et al., 2013; Oliveira et al., 2014). In the end, users are more demanding and aware of the shortcomings of information systems in their daily work. (Goodhue & Thompson, 1995; Yadegaridehkordi E, 2016), have proven that task characteristics significantly influence technology's suitability for individual *tasks*.

The Influence of Technology Characteristics on TTF

Based on the results of the analysis in Table 8, a t-statistic value of 38.688 (>1.96) and p-value (0.000) meets the requirements (<0.05), so it can be concluded that there is a significant favorable influence between Technology Characteristics on Task Technology Fit. This means that there is an influence of technological characteristics on Technology and Task Suitability.

Technology characteristics are the tools (hardware, software, and information) individuals use to accomplish tasks. The features of the technology may affect a user's use and perception of the technology. (Ambra et al., 2013; Goodhue & Thompson, 1995).

pISSN: 2442-3386 eISSN: 2442-4293
Vol 9 No 2 Jul – Des 2023, 119 - 122
Melek IT
INFORMATION TECHNOLOGY JOURNAL

Technical indicators form the basis for assessing the use of information technology, which assesses the effectiveness of Task Technology Fit (TTF). (Goodhue & Thompson, 1995) argue that Task-Technology Fit is a model in which technology helps people complete tasks so that task needs and task skills become efficient with the presence of technology. TTF is based on the idea that system utilization and user efficiency will increase when task and information technology characteristics are well integrated. This demonstrates that TTF is influenced by task characteristics and the practicality of technology in assisting users in accomplishing tasks. As a result, experts contend that technical qualities are positively related to TTF.

The findings of this investigation are consistent with the research of (Goodhue & Thompson, 1995), which showed that technology characteristics are a significant factor affecting TTF. Studies also show technical characteristics influence TTF (Ahmed & Kader, 2017; Ambra et al., 2013; Yadegaridehkordi E, 2016).

The Influence of TTF on EUCS

Based on the results of the analysis in Table 8, a t-statistic value of 4.358 (>1.96) and a qualified p-value (0.000) (<0.05) was obtained, so it can be concluded that there is a significant favorable influence between *Task Technology Fit* and End User Computing Satisfaction. This means that there is an effect of Technology and Task Conformity on End-User Computing Satisfaction.

The EUCS model developed by (Doll Torkzadeh, 1988) is one of the models used to measure user satisfaction with information systems. An organization's information system can be trusted if it has high quality and can provide satisfaction to its users. Organisations' Information systems are received with user satisfaction and ease of use. User satisfaction is the benchmark for the success of information system development. Therefore, the EUCS model positively influences the TTF (Task Technology FIT) model. The core of the Task Technology Fit model is a formal structure known as Task Technology Fit (TTF), namely the suitability of technical skills with work task requirements, namely the ability of information technology to support work (Dishaw et al., 2002).

Indirect Effect of Task Characteristics on EUCS through TTF

The results of the analysis based on Table 8 state that the t-statistic value of 4.829 (>1.96) and p-value (0.000) meet the requirements (<0.05) so that it can be stated that there is a significant favorable influence between Task Characteristics on End User Computing Satisfaction through Task Technology Fit. (Ha J.H, 2014) argues that if a person can complete a task using one learning style in various ways, whether visual, auditory, reading/writing, or kinesthetic, they can further develop their ability to use those strategies in learning. The use of technology produces results that vary according to the achievement of Task Technology Fit and the influence of learning styles. Compatibility is required before technology affects how students learn to use the Moodle LMS.

This compatibility affects how Moodle LMS can support user tasks, so using technology based on end-user satisfaction will positively impact its use. Technology can also create user attitudes in the form of beliefs and influences on the system, and user satisfaction in using the system can increase usage both directly and indirectly (Goodhue & Thompson, 1995b). Therefore, students should be able to feel that the Moodle LMS feature is easy to use and valuable for completing tasks.

Indirect Effect of Technology Characteristics on EUCS through TTF

The results of the analysis based on Table 8 state that the *t-statistic value of* 4.202 (>1.96) and *p-value (0.000)* meets the requirements (<0.05) so that it can be stated that there is a significant favorable influence between Technology Characteristics on End User Computing Satisfaction through Task Technology Fit.

(Goodhue & Thompson, 1995) argue that advanced technology cannot always increase productivity and that information technology must be compatible with humans to complete tasks. In other words, although a technology can be considered advanced or advanced, if it does not meet the requirements of the user's task, it is unlikely that they will use it. The effect of the Fit Technology Task on the use of Moodle LMS is based on end-user satisfaction (trust and satisfaction) with its benefits. With the Fit Technology Task, users are convinced of the benefits and uses of technology and make users use technology in a way that has a positive impact on users. The use of appropriate technology in completing tasks makes technology a supporting factor in learning.

III. CONCLUSION

3.1 Conclusion

This study verifies some prior research findings that user satisfaction with a computer information system, in this case, the LMS learning application in the university setting, is determined by how dependable and valuable students feel as users of the application. In this study, the most dominant usefulness is stated when students feel the ease of downloading material, doing assignments, and interacting with lecturers through LMS. The convenience can be felt by students when the technology in the LMS application has various features that support this and follow student needs in receiving and implementing learning provided by lecturers. Student satisfaction is also predominantly influenced by the reliability of technology in LMS to present learning materials in various media that make it easier for students to understand the material provided. No less important factor is also the learning results that students can immediately see through LMS after doing the assignments given by the lecturer.

This research has limitations on the type of online learning application because the object of research and respondents only involve one university. The author suggests that future research can compare several online learning support applications with a broader range of respondents.

3.2 Implication

The findings of this study have managerial implications for the university to increase student learning satisfaction in the online learning model by utilizing LMS as a platform. The satisfaction felt by students in using LMS can indeed only be obtained with the ability of lecturers to manage online learning through the LMS. Higher education institutions must also be able to choose the right LMS platform by their capacity, capabilities, and resources so that the purpose of utilizing information technology in online learning can be achieved as desired.

REFERENCES

[1] Ahmed, Z., & Kader, A. (2017). *mBanking adoption; Exploratory factor analysis; UTAUT; TTF; Bangladesh*. http://www.icommercecentral.com

[2] Ambra, J. D. , Wilson, C. S., & Akter, S. (2013). *Application of the task-technology fit model to structure and evaluate Application of the task-technology fit model to structure and evaluate the adoption of e-books by academics. Recommended Citation*. https://ro.uow.edu.au/ comm-papers/3189

[3] Chin, W. W. (1998). *The Partial Least Squares Approach for Structural Equation Modeling*.

[4] Chin, W. W., & Dibbern, J. (2010). An Introduction to a Permutation Based Procedure for Multi-Group PLS Analysis: Results of Tests of Differences on Simulated Data and a Cross-Cultural Analysis of the Sourcing of Information System Services Between Germany and the USA. In *Handbook of Partial Least Squares* (pp. 171–193). Springer Berlin Heidelberg. https://doi.org/10.1007/978-3-540-32827-8_8

[5] Coates, H., James, R., & Baldwin, G. (2005). A Critical Examination Of The Effects Of Learning Management Systems On University Teaching And Learning. *Tertiary Education and Management 2005 11:1*, *11*(1), 19–36. https://doi.org/10.1007/ S11233-004-3567-9

[6] Cronbach, L. J. (1951). *Coefficient Alpha and The Internal Structure of Tests*.

[7] Dishaw, M. T., Strong, D. M., & Bandy, D. B. (2002). *2002-Eighth Americas Conference on Information Systems*. https://www.researchgate.net/publication/228781418

[8] Doll, W. J., & Torkzadeh, G. (1988). The Measurement of End-User Computing Satisfaction. *MIS Quarterly*, *12*(2), 259. https://doi.org/10.2307/ 248851

[9] Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error. In *Source: Journal of Marketing Research* (Vol. 18, Issue 1).

[10] Goodhue, D. L., & Thompson, R. L. (1995). Task-technology fit and individual performance. *MIS Quarterly: Management Information Systems*, *19*(2), 213–233. https://doi.org/10.2307/249689

[11] Ha J.H, S. Y. (2014). An Analysis on the Relation of Elementary Students' VARK Styles and Scientific Communication Skills. *Journal of Korean Elementary Science Education*, *33*(4), 724–735.

[12] Hair JR. J.F, Anderson R.E, Tatham R.L, & Black W.C. (2009). *Multivariate Data Analysis Fifth Edition*. Prentice Hall, Inc.

[13] Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, *20*, 277–319. https://doi.org/10.1108/S1474-7979(2009)0000020014

[14] Klarner, P., Sarstedt, M., Hoeck, M., & Ringle, C. M. (2013). Disentangling the Effects of Team Competences, Team Adaptability, and Client Communication on the Performance of Management Consulting Teams. *Long Range Planning*, *46*(3), 258–286. https://doi.org/10.1016/J.LRP.2013.03.001

[15] McGill, T. J., & Klobas, J. E. (2009). A task–technology fit view of learning management system impact. *Computers & Education*, *52*(2), 496–508. https://doi.org/10.1016/J.COMPEDU.2008.10.002

[16] Nasser, R., Cherif, M., & Romanowski, M. (2011). Factors that Impact Student Usage of the Learning Management System in Qatari Schools Nasser. In *Cherif and Romanowski* (Vol. 12, Issue 6).

[17] Oliveira, T., Faria, M., Thomas, M. A., & Popovič, A. (2014). Extending the understanding of mobile banking adoption: When UTAUT meets TTF and ITM. *International Journal of Information Management*, *34*(5), 689–703. https://doi.org/ 10.1016/j.ijinfomgt.2014.06.004

pISSN: 2442-3386 eISSN: 2442-4293
Vol 9 No 2 Jul – Des 2023, 121 - 122
Melek IT
INFORMATION TECHNOLOGY JOURNAL

[18] Pallant, J. (2020). *A Step-by-Step Guide to Data Analysis Using SPSS for Windows*.

[19] RIAD, A. M. , E.-M. H. K. , & E.-G. H. A. (2009). Evaluation Of Utilizing Service-Oriented Architecture As A Suitable Solution To Align University Management Information Systems And Learning Management Systems. *Turkish Online Journal of Distance Education*, *10*(4), 27–40.

[20] Sarstedt, M., Hair, J. F., Nitzl, C., Ringle, C. M., & Howard, M. C. (2020). Beyond a tandem analysis of SEM and PROCESS: Use of PLS-SEM for mediation analyses! *International Journal of Market Research*, *62*(3), 288–299. https://doi.org/10.1177/1470785320915686

[21] Srichanyachon, A. N. (2014). *EFL LEARNERS' PERCEPTIONS OF USING LMS* (Vol. 13, Issue 4).

[22] Straub, D., & Gefen, D. (2004). Validation Guidelines for IS Positivist Research. *Communications of the Association for Information Systems*, *13*. https://doi.org/10.17705/1cais.01324

[23] Yadegaridehkordi E, L. N. A. N. (2016). Task-Technology Fit Assessment of Cloud-Based Collaborative Learning Technologies. *International Journal of Information Systems in the Service Sector*, *8*(3), 58–73.

[Halaman ini sengaja dikosongkan]