

Service Quality and LMS Usage in University: The Mediation Role of User Satisfaction and the Moderating Role of Flexibility-Oriented Culture

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DOI: <https://doi.org/10.26740/jpeka.v10n2.p149-174>

Sections Info

Article history:

Submitted: May 22, 2026

Final Revised: June 10, 2026

Accepted: June 22, 2026

Published: July 08, 2026

Keywords:

Service quality

User satisfaction

System use

Flexibility culture

LMS

ABSTRACT

Objective: This research seeks to analyse the impact of service quality and user satisfaction on system use directly, as well as through the moderating effect of flexibility-oriented culture and system use as a mediator in the context of the SiDia LMS at Universitas Negeri Surabaya (Unesa). **Method:** An explanatory quantitative approach with data analysis using PLS SEM assisted by SmartPLS 4.0 software was used in this study. The research sample consisted of active lecturers at Unesa, selected using proportional stratified random sampling, resulting in 264 respondents. **Results:** The findings show that service quality has a significant effect on user satisfaction but does not have a significant effect on system use in the use of SiDia LMS at Unesa. User satisfaction is confirmed to have a significant effect on system use and fully mediates the association between service quality and system use. A flexibility-oriented culture failed to act as a moderating variable. The accomplishment of SiDia implementation at Unesa is more determined by the quality of user experience and system support services than by organisational flexibility culture. SiDia development needs to focus on improving the quality of operational services and integrating LMS usage through user experience analytics and differentiated support. **Novelty:** This research focuses on developing a model for LMS success by integrating mediation and moderation mechanisms simultaneously within the ISSM framework, incorporating a flexibility-oriented culture as an organisational contextual factor, which is still rarely done.

INTRODUCTION

In the context of higher education in Indonesia, which is moving towards a modern university, the learning management system (LMS) has become a primary spearhead (Madyatmadja, 2023; Prayogo et al., 2025). Various learning functions used by lecturers and students are now integrated into an LMS that has evolved into a modern learning ecosystem platform (Langa & Moeti, 2025; Petrovic & Jaksic, 2026). Successful implementation of the LMS will create an effective learning management ecosystem (Dahal et al., 2023; Ramadhani et al., 2025). The success of LMS use becomes one of the important indicators in the digital transformation of universities towards an adaptive and integrated learning system.

One of the universities actively using and developing an LMS is Universitas Negeri Surabaya (Unesa). Unesa has adopted a blended learning approach and implemented Sinau Digital (SiDia) (Nadwi & Nuryana, 2025; Yuniati et al., 2025). SiDia was created from various aspirations to become a digital learning platform covering assignments, exams, and learning administration. However, based on initial observations, there is a significant gap in the intensity of SiDia usage across faculties. Monthly activity patterns on SiDia tend to spike only during specific periods, such as exams, assignment submissions, or other administrative needs. This condition indicates that LMS usage by

lecturers has not yet been fully internalised as a routine learning practice, but rather remains event-driven usage triggered by short-term needs.

The complexity of using SiDia has increased as the number of active lecturers grows and the heterogeneity of user characteristics in the Unesa environment rises. The growth in the number of lecturers over the past year has shown diversity in generations, technological adaptability, and varying levels of digital literacy. On the other hand, the diversity of characteristics across 14 faculties, with differing academic cultures and learning needs, also has the potential to influence LMS usage patterns. These conditions highlight the importance of analysing the factors affecting system usage.

The success of an LMS is determined by the technology and quality of service during system usage. In the Information Systems Success Model (ISSM), service quality is a crucial dimension of information system success through increased user satisfaction and system use (Delone & McLean, 2003; Saba et al., 2025). In a digital learning environment, service quality is reflected in the system provider's ability to offer technical support, respond quickly to user issues, facilitate easy access to assistance, and ensure services match user needs (Almusfar, 2025). When the services received are able to support learning activities, users tend to have a more positive experience, which in turn increases satisfaction and encourages more intensive use of the LMS.

Although the relationship between service quality, user satisfaction, and system usage has been widely explained in ISSM, the effectiveness of service quality in shaping user satisfaction does not always occur uniformly across institutions. These differences can be influenced by the organisational context in which the technology is used. The Theory of Planned Behavior (TPB) perspective explains that technology usage behaviour is also influenced by the social environment that shapes users' perceptions and responses to a system (Ajzen & Schmidt, 2020; Durga et al., 2025). In the context of higher education, the influence of the social environment can be reflected through the organisational culture that shapes adaptation patterns to digital changes and innovation.

In recent organisational culture literature, the emergence of a flexibility-oriented culture is marked by a high level of adaptability (Awawdeh, 2025; Hassan et al., 2025; P. Yadav & Bagri, 2025). This characteristic is increasingly relevant in the era of digital transformation as the utilization of educational technology also depends on the readiness of the organisational environment to integrate technology into daily academic activities. Compared to subjective norms that focus more on providing resources and formal support, a flexibility-oriented culture represents the organisational conditions that can explain how digital changes are accepted by the user community within an institution (Hassan et al., 2025; Ömür et al., 2025). In an environment with a flexibility orientation, support through the LMS tends to be more easily accepted. The opposite also applies.

Several previous research has sought to verify the nexus between factors affecting system usage in various management system contexts. Research by Almusfar, (2025) found that service quality significantly influences user satisfaction in LMS at several universities in Saudi Arabia. Similar findings were also reported by Elmunyah et al., (2023) referring to the Delone and McLean Model for vocational teachers. On the other hand, research by Chaw & Tang, (2018) discovered that good service quality can encourage system use in LMS at the university level. Interestingly, this finding was not

in line with research by Mailoor & Tjhin, (2025) as service quality did not significantly affect system use at PT. PLN (Persero) due to mandatory use.

In the context of semi-mandatory LMSs like SiDia, the use of the system is indeed required in academic activities, but users still have flexibility in the intensity and quality of their interactions with the system. In such conditions, service quality tends not to directly determine system usage (Mailoor & Tjhin, 2025; Song, 2025), as usage is already institutionally mandated. Conversely, service quality plays a greater role in shaping user satisfaction, which then becomes an important psychological factor influencing the depth and continuity of system usage. Differences in usage context (voluntary, mandatory, or semi-mandatory) can explain variations in previous research findings.

Research by Al-Shargabi et al., (2021) highlights that user satisfaction in terms of students determines system use in e-learning at Jazan University. This finding is supported by Salam & Farooq, (2020) in the aspects of web-based collaborative learning. Interestingly, factors related to system use are not only directly linked. Research by Chu, (2023) has attempted to apply a flexible organizational culture as a moderator for service quality on user satisfaction in a business world. On the other hand, user satisfaction is also suitable as a mediating variable, as demonstrated by Purnomo et al., (2022) in the context of university e-learning. The reinforcement of user satisfaction as an intermediary is also indirectly manifested in research by Riatun & Lestari, (2022) showing that user satisfaction is important for predicting the intention to use e-learning, and user satisfaction is also influenced by service quality itself.

Based on a review of previous research, there are several research gaps that need to be addressed. First, there remain inconsistencies in findings regarding the relationship between service quality and system use in various information system contexts. Some studies on LMS in higher education indicate that service quality can enhance system use, while other research in mandatory system organisational environments shows different results. These inconsistencies suggest that the association between service quality and system use is not yet universal. Furthermore, most previous studies have focused on direct relationships between variables within the ISSM framework, while indirect mechanisms through user satisfaction remain relatively limited, especially in the context of LMS in Indonesian higher education institutions.

Secondly, research on the role of organisational culture in determining the success of LMS is still limited. Although some studies have examined flexibility-oriented organisational culture as a moderating variable, most of these studies were conducted in the context of business or corporate organisations. The capacity of a flexibility culture as a moderator in higher education environments, notably in the use of semi-mandatory LMS, is still rarely studied. Yet, higher education institutions have different characteristics compared to business organisations. It remains unclear whether a flexibility-oriented culture can strengthen the association between service quality, user satisfaction, and system usage in the setting of LMS in higher education.

Third, most LMS research considers students as the primary unit of analysis, whereas studies focusing on lecturers as LMS users are still relatively limited. In fact, lecturers have a strategic role in determining the success of LMS implementation, as they are not only users but also designers and facilitators of technology-based learning

activities. Understanding the factors that influence lecturers' use of LMS still requires further attention.

To address this gap, this study aims to analyse the influence of service quality on system use both directly and indirectly through user satisfaction, as well as to examine the role of a flexibility-oriented culture as a moderating variable in the context of university LMS.

The choice of a flexibility-oriented culture as a moderating variable is based on its position as a contextual organisational factor that does not directly shape user satisfaction. In the context of semi-mandatory LMS use, lecturers have the freedom to decide how and to what extent to utilise the system, so a culture that promotes flexibility, autonomy, adaptability, and collaboration is expected to either strengthen or weaken the influence of service quality on user satisfaction.

Compared to other dimensions such as hierarchical culture which emphasises control and compliance, clan culture which focuses on social relationships, or innovation culture which emphasises creativity, the flexibility-oriented culture is more directly related to how individuals adapt in using the mandated systems. This dimension is considered most relevant for explaining the variation in the impact of service quality on satisfaction and the use of LMS in the context of SiDia Unesa.

The novelty of this research lies in the development of an LMS success model through the simultaneous integration of mediation and moderation mechanisms within the ISSM framework, testing flexibility culture in the context of a semi-mandatory LMS at Indonesian universities, and using lecturers as the unit of analysis. The study was conducted on the SiDia Unesa system using the latest data which has not been analysed in previous research.

The theoretical contribution of this research lies in the expansion of ISSM development and literature through the integration of organisational culture perspectives, which form the basis of TPB, to explain variations in LMS usage behaviour. This study also provides empirical insights on how service quality can be translated into system usage through user satisfaction in the higher education context. Practically, the research is expected to provide a basis for evaluating LMS implementation regarding system service effectiveness, user experience, and the role of a more flexible organisational culture in supporting digital learning transformation in higher education. The conceptual model and research hypothesis are explained in Figure 1:

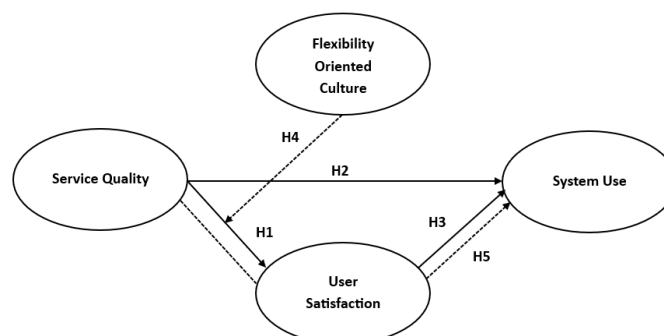


Figure 1. Conceptual framework.

- H1: Service Quality affects User Satisfaction in the use of SiDia Unesa LMS.
- H2: Service Quality affects System Use in the use of SiDia Unesa LMS.
- H3: User Satisfaction affects System Use in the use of SiDia Unesa LMS.
- H4: Flexibility-oriented culture moderates the relationship between service quality and user satisfaction in the use of SiDia Unesa LMS.
- H5: User Satisfaction mediates the relationship between service quality and system use in the use of SiDia Unesa LMS

RESEARCH METHOD

Study Design

This research employs an explanatory quantitative approach to explain the direct and indirect effects between the variables service quality, user satisfaction, and flexibility-oriented culture on LMS SiDia system use at Unesa. The research was conducted from October 2025 to March 2026. The study employed a survey method on respondents. Partial Least Squares Structural Equation Modelling (PLS-SEM) was used to verify the related hypotheses.

Sample Selection and Data Collection

The population under investigation includes all active lecturers at Universitas Negeri Surabaya (Unesa) who are registered in the personnel system and have access rights as well as operational authority over SiDia. Based on the 2025 administrative data, the total population is 1,733 lecturers distributed across 14 faculties. The sampling technique used is proportional stratified random sampling to ensure the representation of each faculty according to the proportion of lecturers.

Out of a total of 1,733 lecturers who comprised the population, 264 complete and valid questionnaires were collected, resulting in a response rate of 15.23% for this study. In determining the minimum sample size for this reflective model, this study initially considers the foundational 10-times rule by Hair et al., (2011). To ensure a more conservative approach and robust statistical power, this guideline is extended using the recommendations of Kline, (2015), which suggest a range of 10 to 20 times the number of reflective indicators of the most complex construct. In this study, the User Satisfaction construct contains the highest number of reflective indicators (7 items), resulting in a recommended minimum sample range of 70 to 140 respondents. Therefore, with a final sample of 264 respondents, the sample size of this study substantially exceeds the minimum threshold and is highly adequate to produce stable and reliable PLS-SEM model estimates."

An online questionnaire was employed to collect the data distributed using Google Forms. To evaluate the potential for non-response bias, this study applied the procedure recommended by Armstrong & Overton, (1977) by comparing the first 25% of respondents (early respondents, $n = 66$) with the last 25% of respondents (late respondents, $n = 66$). Differences in the mean for each research construct were tested using an independent samples t-test. The test results showed that there were no significant differences in the constructs of Service Quality ($p = 0.157$), User Satisfaction ($p = 0.738$), Flexibility-Oriented Culture ($p = 0.296$), or System Use ($p = 0.904$). All variable

p-values were $p > 0.05$. It can be concluded that non-response bias does not pose a significant threat to the validity of the research findings.

Instrument Development

The main research instrument was a closed-ended questionnaire. Responses were measured using a 5-point Likert scale from 1 (firmly disagree) to 5 (firmly agree). The service quality variable was measured using several indicators including training, documentation & user guidelines, service reliability, service responsiveness, empathy, contact, and interactivity, which were modified from DeLone & McLean, (2016) and Mailoor & Tjhin, (2025). The user satisfaction variable included satisfaction with the system, satisfaction with information, and satisfaction with service, modified from Mailoor & Tjhin, (2025).

The flexibility-oriented culture variable was modified from Ni et al., (2021), including resistance to technological change, open communication between superiors and subordinates, teamwork and collaboration, cross-disciplinary learning, and attention to user well-being. The system use variable was modified from Mailoor & Tjhin, (2025) and included several indicators, namely nature of use, frequency of use, and extent of use. A total of 18 items were used.

The evaluation results of the measurement model indicate that the frequency of use indicator has an outer loading value of 0.614. Nevertheless, this indicator still exceeds the minimum threshold of 0.60 recommended for exploratory research and is retained because it represents a usage behaviour dimension different from the other indicators. Additionally, the system use construct shows a Composite Reliability value of 0.801 and an Average Variance Extracted (AVE) above 0.50, suggesting adequate composite reliability and convergent validity. Although the Cronbach's Alpha coefficient (0.636) is slightly below the 0.70 threshold. Hair et al., (2021) state that in exploratory research, reliability values between 0.60–0.70 are still acceptable if other indicators of construct validity are adequate.

Data Analysis

The research utilized PLS-SEM as the data analysis technique implemented in SmartPLS 4.0 software. The steps undertaken include model specification, outer model evaluation, and inner model evaluation. This research model included service quality as the exogenous variable, user satisfaction as the mediating variable, flexibility-oriented culture as the moderating variable, and system use as the endogenous variable. Outer model evaluation is conducted through testing the reliability and construct validity. Reliability is measured using composite reliability, while construct validity is tested through convergent validity and discriminant validity. In the inner model evaluation stage, the study assessed the associations among variables through testing immediate and mediated effects to verify the hypotheses.

RESULTS AND DISCUSSION

Results

Characteristics of Respondents

Table 1. Characteristics of research respondents.

Characteristics	Category	Frequency	Percentage
Faculty	Faculty of Economics and Business	118	44.7%
	Faculty of Education	22	8.3%
	Faculty of Languages and Arts	21	8.0%
	Faculty of Engineering	20	7.6%
	Faculty of Vocational Studies	19	7.2%
	Faculty of Mathematics and Natural Sciences	17	6.4%
	Faculty of Social and Political Sciences	14	5.3%
	Faculty of Sports Sciences	10	3.8%
	Faculty of Law	9	3.4%
	Campus 5 of Unesa	4	1.5%
	Faculty of Food Security	4	1.5%
	Graduate School	3	1.1%
	Faculty of Psychology	2	0.8%
	Faculty of Medicine	1	0.4%
Age	≤ 40 years old	161	61.0%
	41 – 50 years old	72	27.3%
	≥ 51 years old	31	11.7%
Gender	Male	135	51.1%
	Female	129	48.9%
Length of work	≤ 5 years	80	30.3%
	6 – 15 years	123	46.6%
	≥ 16 years	61	23.1%
Experience using SiDia	Less than 1 year	55	20.8%
	1 – 2 years	95	36.0%
	More than 2 years	114	43.2%
Number of courses with LMS	1 – 2 Courses	61	23.1%
	3 – 4 Courses	126	47.7%
	5 – 7 Courses	50	18.9%
	≥ 8 Courses	27	10.2%

Based on Table 1, the majority of lecturers come from the Faculty of Economics and Business, totaling 118 respondents (44.7%). By age, most respondents are ≤ 40 years old, accounting for 61.0%, indicating the dominance of lecturers of productive age in using the SiDia LMS. In terms of gender, the composition of respondents is relatively balanced, with 135 female respondents (51.1%) and 129 male respondents (48.9%). Based on length of service, the majority of respondents have 6–15 years of experience, accounting for 46.6%. Furthermore, most respondents have been using SiDia for more than two years, and the majority manage 3–4 courses using the LMS, amounting to 47.7%. These findings

Service Quality and LMS Usage in University: The Mediation Role of User Satisfaction and the Moderating Role of Flexibility-Oriented Culture indicate that the research respondents are dominated by lecturers with considerable LMS usage experience.

Outer Model Evaluation

Convergent Validity

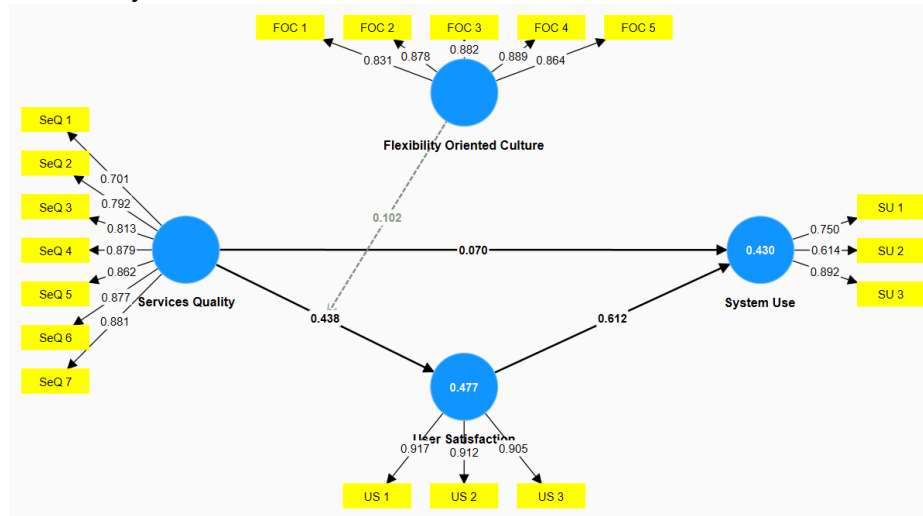


Figure 2. Convergent validity output.

Table 2. Outer loading and AVE.

Variable	Indicator	Outer Loading	AVE
Service Quality	Training	0.701	0.755
	Documentation & User Guidelines	0.792	
	Service Reliability	0.813	
	Service Responsiveness	0.879	
	Empathy	0.862	
	Contact	0.877	
	Interactivity	0.881	
User Satisfaction	Satisfaction with the System	0.917	0.692
	Satisfaction with Information	0.912	
	Satisfaction with Service	0.905	
Flexibility Oriented Culture	Resistance to Technological Change	0.831	0.578
	Open Communication between Superiors and Subordinates	0.878	
	Teamwork and Collaboration	0.882	
	Cross-Disciplinary Learning	0.889	
	Attention to User Well-Being	0.864	
System Use	Nature of Use	0.750	0.831
	Frequency of Use	0.614	
	Extent of Use	0.892	

The outer loading values used refer to a minimum threshold of ≥ 0.60 . Reflected from the output, all indicators of the variables service quality, user satisfaction, flexibility-oriented culture, and system use have outer loading values above 0.60, indicating that all indicators are valid. The highest outer loading value for the service quality variable is found in the interactivity indicator at 0.881 and service responsiveness at 0.879, indicating that service interaction quality and service responsiveness are the dominant aspects in shaping the perception of LMS SiDia service quality. The AVE test results show that all constructs have AVE higher than 0.50, namely service quality at 0.755, user satisfaction at 0.692, flexibility-oriented culture at 0.578, and system use at 0.831.

Discriminant Validity

Discriminant validity testing was conducted using the Fornell-Larcker criterion and Heterotrait-Monotrait Ratio (HTMT)

Table 3. Fornell-Larcker criterion discriminant validity.

	Flexibility Oriented Service	Service Quality	System Use	User Satisfaction
Flexibility Oriented Service	0.869			
Service Quality	0.466	0.832		
System Use	0.511	0.433	0.760	
User Satisfaction	0.572	0.593	0.653	0.911

Reflected from the Fornell-Larcker criteria, the AVE root value corresponding to each latent variable is higher than the correlations between the other constructs. These results indicate that each construct has appropriate discriminant validity.

Table 4. HTMT criterion discriminant validity.

	Flexibility Oriented Service	Service Quality	System Use	User Satisfaction	Flexibility Oriented Service X Service Quality
Flexibility Oriented Service					
Service Quality	0.498				
System Use	0.676	0.519			
User Satisfaction	0.626	0.642	0.831		
Flexibility Oriented Service X Service Quality	0.182	0.220	0.108	0.040	

The HTMT test results show that all correlation count between constructs are lower than 0.90 critical value. These results reinforce that the research constructs have met discriminant validity.

Table 5. Cronbach's alpha and composite reliability.

Variable	Cronbach's Alpha	Composite Reliability
Flexibility Oriented Service	0.919	0.939
Service Quality	0.925	0.940
System Use	0.636	0.801
User Satisfaction	0.898	0.936

The analysis results show that all variables have a Cronbach's Alpha value above 0.60 and a Composite Reliability value above 0.70. These outputs indicate that all constructs have good internal consistency and are reliable.

Inner Model Evaluation

Table 6. The result of the Inner Variance Inflation Factor (VIF).

	Flexibility Oriented Service	Service Quality	System Use	User Satisfaction	Flexibility Oriented Service x Service Quality
Flexibility Oriented Service				1.288	
Service Quality			1.541	1.309	
System Use					
User Satisfaction			1.541		
Flexibility Oriented Service x Service Quality				1.057	

Multicollinearity testing was conducted using VIF. The test results showed that all VIF values were below 5, indicating no multicollinearity issues.

R-squared

Table 7. R-squared value.

Variable	R-squared
System Use	0.430
User Satisfaction	0.477

The analysis results indicate that the user satisfaction aspect has an R-square of 0.477. This value shows that service quality and a flexibility-oriented culture can explain 47.7% of the variation in user satisfaction, while 52.3% is driven by additional variables not included. This output is regarded as moderate. Meanwhile, the system use aspect has an R-square of 0.430. These results show that service quality and user satisfaction can

Service Quality and LMS Usage in University: The Mediation Role of User Satisfaction and the Moderating Role of Flexibility-Oriented Culture explain 43.0% of the variation in system use, while 57.0% is effected by other factors not analysed in this study.

Predictive Relevance (Q^2)

Table 8. Q^2 value.

Construct	Q^2
Flexibility-Oriented Culture	0.000
Service Quality	0.000
System Use	0.237
User Satisfaction	0.386

User Satisfaction ($Q^2 = 0.386$) is greater than 0 and exceeds 0.35, implying that the framework has large predictive relevance in predicting User Satisfaction. System Use ($Q^2 = 0.237$) is greater than 0 and falls between 0.15–0.35, implying a moderate level of predictive relevance for the model in predicting System Use.

Model Fit (SRMR)

Table 9. Model Fit.

	Saturated Model	Estimated Model
SRMR	0.081	0.085
d_ULS	1.118	1.231
d_G	0.334	0.342
Chi-square	531.982	541.247
NFI	0.852	0.849

The model fit was evaluated using the Standardized Root Mean Square Residual (SRMR). The analysis results showed an SRMR value of 0.081. This value is beneath the maximum threshold of 0.10, reflecting that the model has an acceptable fit.

Predictive Power

Table 10. Predictive Power Result.

	Q^2 Predict	RMSE	MAE
System Use	0.284	0.853	0.678
User Satisfaction	0.445	0.751	0.564

The predictive ability of the model was evaluated using the PLSpredict procedure. A model has predictive relevance if the Q^2 predict value for the endogenous construct is greater than zero. The analysis results showed that the Q^2 predict value for User Satisfaction was 0.445 and for System Use was 0.284. Both values are above zero, indicating that the model has adequate predictive ability for both endogenous constructs. Additionally, the higher Q^2 predict value for User Satisfaction indicates that the model has a stronger predictive ability for User Satisfaction compared to System Use. The relatively low RMSE and MAE values also implied that the model's prediction error is within an acceptable range.

Table 11. F-squared value.

Relation	F-squared	Interpretation
Service Quality > User Satisfaction	0.280	Medium-large
Service Quality > System Use	0.006	Very small
User Satisfaction > System Use	0.426	Large

The analysis results indicate that User Satisfaction is the most dominant predictor of System Use with an f^2 value of 0.426. Conversely, the immediate impact of Service Quality on System Use only yields an f^2 value of 0.006, indicating a negligible effect. These findings suggest that service quality does not directly motivate lecturers to increase the use of SiDia. Service Quality has a relatively strong influence on User Satisfaction ($f^2 = 0.280$). This result shows that improving service quality, such as service reliability, support responsiveness, availability of documentation, and user training, first enhances lecturers' satisfaction with the system. This satisfaction then becomes the main factor driving the use of SiDia in learning activities.

Hypothesis Testing

Table 12. Direct influence.

Hypothesis	Path Coefficient	P-value	95% Path Coefficient Confidence Interval		F-square	Interpretation
			Lower	Upper		
Service Quality > User Satisfaction	0.438	0.000	0.339	0.542	0.280	Significant
Service Quality > System Use	0.070	0.391	-0.085	0.232	0.006	Not significant
User Satisfaction > System Use	0.612	0.000	0.473	0.764	0.426	Significant

1.) Service quality has a significant impact on user satisfaction from coefficient of 0.438, also p-value of 0.000 (<0.05) (H1 accepted). This indicates that the better the LMS SiDia service quality, the higher the user satisfaction; 2.) Service quality has no significant effect on system use with a path coefficient of 0.070 and a p-value of 0.391 (>0.05) (H2 rejected). This finding indicates that service quality has not yet been able to directly increase the use of LMS SiDia by lecturers; 3.) User satisfaction has a positive and meaningful impact on system use with a path coefficient of 0.612 and a p-value of 0.000 (<0.05) (H3 accepted). The greater the lecturers' satisfaction with LMS SiDia, the higher the intensity of system use in learning activities.

Table 13. Indirect influence.

Hypothesis	Path Coefficient	P-value	95% Path Coefficient Confidence Interval		Interpretation
			Lower	Upper	
Service Quality > Flexibility Oriented Culture > User Satisfaction	0.063	0.055	-0.001	0.124	Not Moderation
Service Quality > User Satisfaction > System Use	0.268	0.000	0.185	0.372	Full Mediation

1.) Test results reflect a moderation coefficient of 0.063 with a p-value of 0.063 (>0.05). This finding indicates that Flexibility Oriented Culture fails to be a moderating variable (H4 rejected); 2.) The intervening impact of service quality on system use through user satisfaction has a coefficient of 0.268 with a p-value of 0.000. This suggests the presence of full mediation (H5 accepted).

Discussion

The Influence of Service Quality on User Satisfaction in the Use of SiDia Unesa

Service quality plays a substantial role in shaping user satisfaction. In addition to being statistically significant, this relationship also shows a relatively strong effect size with an f^2 value of 0.280. An understanding gained through the pattern of significantly increased use of SiDia during crucial academic periods, such as exams, assignment submissions, and grade entry. In these situations, lecturers rely on the technical quality of the system and the quality of service provided when problems occur. It should be noted that lecturer satisfaction is more influenced by the service experience they directly encounter, such as ease of access to technical support, the response of administrators when problems arise, and the effectiveness of the LMS in facilitating communication and the learning process. In a higher education environment with a large number of lecturers and heterogeneous user characteristics, such as Unesa, the quality of interaction between users and system administrators becomes a crucial factor in building a positive usage experience (Dewi et al., 2023; Teja et al., 2025).

These findings are consistent with Almusfar, (2025) research which found that service quality is an important determinant of LMS user satisfaction in higher education. Similar results were also found on the e-learning platform at STEKOM University (Susilowati, 2020). However, the context of SiDia shows a higher level of complexity because the system is not only used as a medium for delivering material, but also supports learning activities, evaluation, academic administration, and coordination of various stakeholders. Therefore, service quality in the context of SiDia is not only related

to technical aspects, but also includes the system and its administrators' ability to support diverse academic needs.

This fact strengthens the ISSM which positions service quality as one of the main antecedents in the formation of user satisfaction. In the university LMS, the quality of service has a substantial contribution even though the system has become part of routine academic activities. The success of the LMS also depends on the organisation's ability to provide service support that meets user needs (Almusfar, 2025; Ayubi & Retnowardhani, 2025). This finding extends the application of the ISSM, providing evidence that in semi-mandatory digital learning systems, the influence of service quality works more through the post-use evaluation mechanism, which is reflected in user satisfaction.

An effect size value of 0.280 indicates that service quality is a determinant with a fairly strong evident power. In the use of SiDia, user satisfaction is more influenced by the quality of support services received during the system usage process. Conceptually, responsive and easily accessible services that can effectively resolve user problems will reduce perceived effort and enhance the perception of system usefulness in learning activities (Bansah & Darko Agyei, 2022; Cigdem & Ozturk, 2016). This condition results in a positive post-use evaluation.

In the context of LMS, responsive services, the availability of usage guides, and adequate technical support allow users to have a more positive experience when interacting with the system. When lecturers feel the system is able to support the needs of digital and blended learning effectively, the level of satisfaction with the system will increase (Abidin et al., 2021). Service quality acts as a mechanism that shapes users' positive perceptions of the LMS and serves as the foundation for the successful implementation of digital learning systems (Mansor & Kulgemeyer, 2025; Supriyatna et al., 2026). SiDia administrators need to prioritise help services, particularly during academic periods with high usage intensity. Service evaluations also focus on interaction patterns, response speed, and technical barriers frequently encountered by lecturers.

The Influence of Service Quality on System Use in the use of SiDia Unesa

Service quality does not have a significant impact on system use. This relationship also indicates a very small effect size with an f^2 value of 0.006. This condition can be explained by the characteristics of LMS usage in a university environment, which tends to be event-driven and semi-mandatory. Although lecturers consider the SiDia service to be interactive and supported by adequate technical assistance, the decision to use the LMS is largely determined by academic needs. Service quality can create a positive user experience (Idkhan & Idris, 2023), but it does not automatically change system use. System use is more influenced by perceptions of the benefits and relevance of the LMS to learning activities than by the quality of the accompanying service.

The analysis of system use indicators shows that the extent of use is more dominant than the frequency of use. Lecturers tend to utilise SiDia when there is a specific academic need to be addressed, such as managing materials or assigning tasks, rather than as an activity carried out routinely at all times. The use of the LMS in this study is more accurately understood as task-triggered use. This characteristic explains why the F-squared value is very small ($f^2 = 0.006$). The decision to use SiDia is fundamentally determined by structural academic operational obligations and needs, so users must still access the system regardless of their perceptions of service quality. In such circumstances, service quality plays a greater role in shaping the user's experience and evaluation while interacting with the system, but it is not strong enough to change usage behaviour.

In ISSM, in the context of LMS used in a semi-mandatory academic environment, there is indeed an assumption that service quality can enhance system usage (Almusfar, 2025; Paa & Ates, 2013). However, there are exceptions. In systems where usage is primarily dictated by institutional requirements, usage behaviour is more influenced by task requirements than by evaluations of service quality. The pathway from service quality to system use appears to be highly context-sensitive and dependent on system usage characteristics. In an institutionalised LMS environment, service quality plays a greater role in shaping users' evaluations of the system rather than directly affecting usage behaviour.

These findings differ from the research by Chaw & Tang, (2018) and Widyaningrum et al., (2024) which found that service quality affects system use. This difference indicates that the relationship between service quality and system use is highly dependent on the context of system implementation. System use tends to be more influenced by service quality when the system is used voluntarily or is an important part of users' daily activities. Conversely, in the context of SiDia Unesa, LMS use is more influenced by academic requirements and the operational needs of learning. Good service quality plays a greater role in shaping positive user evaluations rather than directly driving system usage behaviour.

Efforts to improve service quality are not sufficient as a core strategy to increase the intensity of SiDia usage. Development focus needs to assimilate into enhancing LMS integration into the academic workflow, making the system the driving force behind daily learning activities. As a note, developing learning analytics features, automatic assessment, and streamlining class management processes can increase lecturers' functional dependence on the LMS (Simanca Herrera et al., 2019). This approach is more relevant than merely improving technical support quality.

The Influence of User Satisfaction on System Use in the use of SiDia Unesa

User satisfaction serves as the main determinant of system use with an f^2 value indicating a large effect. This strong influence can be explained by the characteristics of LMS usage in higher education environments. The continuity of system use largely depends on whether users have a satisfying experience while using the LMS. When lecturers feel that the system helps manage learning and academic administration, the use of LMS as a tool provides real benefits in their work. User satisfaction becomes a mechanism that drives the transition from mandatory use to more voluntary and sustainable use (Muhasyah & Suhud, 2024; Prasetya et al., 2023).

The significant impact of user satisfaction on system use ($f^2 = 0.426$) indicates that variations in SiDia usage behaviour are explained more by post-adoption evaluation than by service quality directly. In the context of a semi-mandatory LMS, the decision to access the system at a minimum level is determined by institutional requirements, leaving service quality little room to directly influence usage behaviour. Conversely, user satisfaction serves as an evaluative mechanism that determines the level of behavioural enactment once usage obligations are met.

User satisfaction plays a role in transforming utilitarian and compliance-driven use into broader system utilisation (Nasution & Muda, 2025; Yarlikaş et al., 2012), so that users not only access mandatory features but also integrate various LMS functions into their learning practices. From the ISSM perspective, these results reinforce the argument that user satisfaction is a proximal construct with a higher predictive power for post-

adoption use compared to service quality, whose influence is indirect through user evaluation mechanisms.

The results of the indicator analysis support this explanation. The most dominant indicator in the user satisfaction construct is satisfaction with the system, followed by satisfaction with information. These findings indicate that lecturer satisfaction is primarily shaped by direct experiences when using SiDia's features in the learning process. System stability, ease of navigation, feature accessibility, and the system's ability to support digital learning activities are key factors in determining whether users will continue to actively use the LMS. When the usage experience is considered positive, lecturers tend to expand the use of various features available within the system (Maurat, 2025).

These findings are in line with the research of (Legramante et al., 2023), which found that user satisfaction is an important determinant of LMS usage. However, the SiDia context provides a more specific insight. Unlike many previous studies involving students as the primary LMS users, this study focuses on lecturers who have more complex usage needs, ranging from content management, assessment, monitoring student activities, to learning administration. User satisfaction becomes a more significant factor because lecturers have the discretion to determine the extent to which the LMS will be integrated into their teaching practices.

The strategy to increase LMS usage should be enhanced not only in terms of system technical aspects but also in creating a satisfying user experience. SiDia managers need to develop a user experience analytics-based approach to identify the most frequently used features, usage obstacles experienced by lecturers, and the specific needs of each faculty. By gaining insight that shape user satisfaction, LMS development can be carried out more adaptively and user-oriented, thereby enabling more sustainable system usage.

The influence of a flexibility-oriented culture as a moderator of the relationship between service quality and user satisfaction in the use of SiDia Unesa

The interaction coefficient of a flexibility-oriented culture does not provide sufficient evidence to indicate a significant change in the relationship between service quality and user satisfaction. The influence of service quality on user satisfaction is relatively consistent, both in work environments perceived to have high and low levels of cultural flexibility. In other words, service quality remains a key factor in shaping user satisfaction regardless of the organisational culture conditions perceived by the lecturers.

These findings are interesting because they show that the influence of service quality on user satisfaction is relatively stable across different levels of flexibility-oriented culture. From the TPB perspective, organisational culture can be seen as part of the social environment that shapes an individual's beliefs and evaluations regarding a behaviour (Ajzen, 1985; Pitogo et al., 2022). However, the research results indicate that this mechanism does not become a dominant differentiating factor in forming user satisfaction with SiDia. In an LMS environment integrated into the formal academic process, user satisfaction is more explained by evaluations of the service quality directly experienced rather than the influence of organisational contextual factors, thus strengthening the position of ISSM in explaining user satisfaction during the post-adoption phase of technology.

Within the ISSM framework, user satisfaction is a direct consequence of the use experience formed through user interaction with the quality of service received (Paa & Ates, 2013; Putra & Retnowardhani, 2024). Therefore, satisfaction evaluation tends to be

more influenced by operational and directly observable service attributes, such as the responsiveness of technical support, service reliability, quality of user-manager interaction, and the system's ability to support the completion of academic tasks. This condition indicates that in an institutionalised LMS environment, the influence of organizational contextual factors becomes relatively weaker compared to the impact of actual use experience.

Another explanation that also needs to be considered is the nature of the flexibility-oriented culture construct used in this study. The adopted indicators largely represent an organisational collaboration climate, such as teamwork, open communication, cross-disciplinary learning, and attention to user wellbeing. Although these aspects reflect a flexible culture, the indicators do not necessarily specifically capture flexibility in the uptake and use of digital technology. This opens up a new probability that the influence of organisational culture on the success of technology implementation may depend more on the form of culture directly related to innovation and technology adoption.

There are differences in findings within the corporate environment which indicate that a flexibility-oriented culture can strengthen the influence of organizational factors on technology acceptance (Abdelrahman et al., 2025; Do et al., 2016). In the corporate context, system use is often more of a voluntary nature, allowing organisational culture greater scope to influence user perceptions and behaviour. Conversely, in the context of higher education, particularly with LMSs that have become part of formal academic processes, service quality appears to have a more direct impact than organisational culture. These differences suggest that the effectiveness of organisational culture as a moderating variable is contextual.

The development priority of SiDia should be focused on improving the quality of services that interact directly with lecturers, especially during high usage periods such as exams and assignment submissions. LMS administrators can develop an academic traffic monitoring system to anticipate surges in usage so that technical support and server capacity can be better prepared. Furthermore, although a culture of flexibility does not act as a moderator, the relatively high indicators of teamwork and cross-disciplinary learning suggest that a user community-based approach still has the potential to support LMS utilisation. Programs for sharing best practices, mentoring among lecturers, and collaborative forums for using SiDia could be more effective strategies.

User Satisfaction as a mediator of the relationship between service quality and system use in the use of SiDia Unesa

The empirical context supports between service quality and system use occurs through a post-use evaluation mechanism, with user satisfaction acting as the key link between service quality and LMS usage behaviour. This mechanism can be explained through the characteristics of LMS use in a semi-mandatory higher education environment. In this context, lecturers continue to use SiDia to meet various academic needs, such as material management, assessment implementation, and learning administration (Supriyatna et al., 2026; Ubaidah et al., 2026). However, the decision to use the system more extensively and sustainably is not solely determined by the availability of good services. Lecturers need to feel that these services genuinely assist their work and are responsive to user needs. User satisfaction becomes the psychological mechanism that translates service quality into system usage behaviour.

These findings are consistent with the research of Legramante et al., (2023), which found that platform service quality enhances user satisfaction, and this satisfaction

ultimately drives the continued use of the system. This pattern of relationships explains why service quality does not show a direct effect on system use, but still contributes through user satisfaction. In the context of a semi-mandatory LMS, the decision to access the system at a minimum level is determined by institutional demands and academic needs, so usage variation is not greatly influenced by perceptions of service quality. Conversely, service quality first shapes users' evaluation of their system usage experience, which is then translated into actual usage behaviour.

Thus, user satisfaction functions as a behavioral transmission mechanism that transforms service quality into post-adoption behaviour. These findings indicate that service quality is a more distal factor in relation to usage behaviour (de Oña, 2021; Yadav et al., 2015), whereas user satisfaction is a more proximal determinant as it directly reflects the outcome of user evaluation after interacting with the LMS. Within the ISSM framework, this mechanism explains that system usage does not increase merely because the service is considered good, but because the service successfully delivers a valuable user experience.

The context of this research also provides different implications compared to studies conducted on systems with voluntary use characteristics. In voluntary systems, service quality can directly influence usage decisions (Dapas et al., 2019; Kim & Kim, 2025). In contrast, in SiDia, which has become part of the formal academic process, service quality plays a greater role in shaping users' affective evaluations rather than directly influencing usage behaviour. These outcomes reflect that the connection between service quality and system use is contextual and influenced by system implementation characteristics.

The development steps for SiDia need to be prioritised on user assessment determinant aspects, such as during assignment uploads and grade input. It should be noted, institutions can implement various strategies, such as using predictive load balancing to anticipate surges in access, providing real-time support services during critical academic periods, and streamlining workflows for the features most frequently used by lecturers. These are practical implications that can be applied periodically. This approach is more relevant than merely improving service operational indicators, as research shows that LMS usage increases when users experience an efficient usage experience.

CONCLUSION

Fundamental Finding: Service quality contributes to system use through user satisfaction, while the direct impact of service quality on system use is not confirmed. These findings indicate that in the context of a semi-mandatory and task-triggered LMS, system usage is more determined by users' evaluation of their experience rather than by the service quality itself. A flexibility-oriented culture does not play a significant role in altering the relationship between service quality and user satisfaction, which is significantly positive in direct way only, indicating that user satisfaction is shaped more by actual usage experience rather than organisational contextual factors. User satisfaction also has a massive impact on system use. **Implication:** This research reinforces the ISSM that user satisfaction is the main mechanism transmitting the influence of service quality on post-adoption system use. These findings extend the TPB discussion that in semi-mandatory usage environments, the influence of socio-organisational factors on user evaluation becomes weaker compared to structural factors and actual usage experience. The development of SiDia needs to focus on enhancing the user experience for the features most frequently used during critical academic periods. Integration of the LMS

with the implementation of predictive load balancing, as well as the provision of real-time support services. **Limitation:** This study was conducted at a single university, so the results are still influenced by the characteristics of LMS implementation. In addition, the organizational culture factors analysed were limited to a flexibility-oriented culture, thus not fully representing the complexity of contextual factors that can affect LMS success. System use characteristics that more accurately reflect the extent of feature utilisation rather than usage frequency also need to be considered. **Future Research:** Further research is recommended to test the model across various higher education institutions with different levels of LMS usage requirements to enhance the generalisability of the findings. The research model can also be developed by including factors more closely related to technology usage behaviour, such as digital literacy, technostress, self-efficacy, innovation culture, or characteristics of voluntary and mandatory use, so that the mechanisms behind LMS success can be more precisely understood.

ACKNOWLEDGEMENTS

The authors sincerely appreciate the support provided by Universitas Negeri Surabaya throughout this research process.

REFERENCES

- Abdelrahman, M., Papamichail, K. N., Hammady, R., Kurt, Y., Abdallah, W., Shixiong Liu, L., & Kapser, S. (2025). Organisational Culture and Knowledge Management Systems Adoption: Examining Employee Usage in Multinational Corporations. *Global Journal of Flexible Systems Management*, 26(3), 439-467. <https://doi.org/10.1007/s40171-025-00448-w>
- Abidin, Z., Rokhman, F., & Mathrani, A. (2021). Exploring the influencing factors of learning management systems continuance intention in a blended learning environment. *International Journal of Innovation and Learning*, 30(2), 175-187. <https://doi.org/10.1504/IJIL.2021.117221>
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In *Action control: From cognition to behavior* (pp. 11-39). Springer.
- Ajzen, I., & Schmidt, P. (2020). Changing Behavior Using the Theory of Planned Behavior. In *The Handbook of Behavior Change* (pp. 17-31). Cambridge University Press. <https://doi.org/10.1017/9781108677318.002>
- Al-Shargabi, B., Sabri, O., & Aljawarneh, S. (2021). The adoption of an e-learning system using information systems success model: a case study of Jazan University. *PeerJ Computer Science*, 7, e723. <https://doi.org/10.7717/peerj-cs.723>
- Almusfar, L. (2025). Improving Learning Management System Performance: A Comprehensive Approach to Engagement, Trust, and Adaptive Learning. *IEEE Access*, PP, 1. <https://doi.org/10.1109/ACCESS.2025.3550288>
- Armstrong, J., & Overton, T. (1977). Estimating Non Response Bias Mail Surveys. *Journal of Marketing Research*, 14, 396-402. <https://doi.org/10.2307/3150783>
<https://journal.unesa.ac.id/index.php/jpeka>

- Awawdeh, E. (2025). The Impact of Flexible Organizational Structure on Universities Employee's Performance and the Moderated Role of Commitment Culture. In A. M. K., M. F.A., A. A., & A. A. (Eds.), *Lecture Notes in Civil Engineering* (Vol. 587, pp. 381–391). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-3-031-84371-6_31
- Ayubi, M. N., & Retnowardhani, A. (2025). Optimizing Learning Experiences: A Study of Student Satisfaction with LMS in Higher Education. *APTISI Transactions on Technopreneurship*, 7(2), 527–541. <https://doi.org/10.34306/att.v7i2.501>
- Bansah, A. K., & Darko Agyei, D. (2022). Perceived convenience, usefulness, effectiveness and user acceptance of information technology: evaluating students' experiences of a Learning Management System. *Technology, Pedagogy and Education*, 31(4), 431–449. <https://doi.org/10.1080/1475939X.2022.2027267>
- Chaw, Lee Yen, & Tang, Chun Meng. (2018). What Makes Learning Management Systems Effective for Learning? *Journal of Educational Technology Systems*, 47(2), 152–169. <https://doi.org/10.1177/0047239518795828>
- Chu, M. (2023). Assessing the Benefits of ChatGPT for Business: An Empirical Study on Organizational Performance. *IEEE Access*, PP, 1. <https://doi.org/10.1109/ACCESS.2023.3297447>
- Cigdem, H., & Ozturk, M. (2016). Factors affecting students' behavioral intention to use LMS at a Turkish post-secondary vocational school. *International Review of Research in Open and Distributed Learning*, 17(3), 276–295. <https://doi.org/10.19173/irrodl.v17i3.2253>
- Dahal, N., Manandhar, N. K., Luitel, B. C., Pant, B. P., Shrestha, I. M., Rajbanshi, R., Dhungana, P., & Dhungana, S. (2023). Reality of e-learning: success and failure of learning management system. In *eLearning and Software for Education Conference* (Vol. 1, pp. 321–327). National Defence University - Carol I Printing House. <https://doi.org/10.12753/2066-026X-23-029>
- Dapas, C. C., Sitorus, T., Purwanto, E., & Ihalauw, J. J. O. I. (2019). The effect of service quality and website quality of zalora.Com on purchase decision as mediated by purchase intention. *Quality - Access to Success*, 20(169), 87–92. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-85061987465&partnerID=40&md5=04b3d820365168318e40fb9cb0522386>
- de Oña, J. (2021). Understanding the mediator role of satisfaction in public transport: A cross-country analysis. *Transport Policy*, 100, 129–149. <https://doi.org/10.1016/j.tranpol.2020.09.011>
- DeLone, W. H., & McLean, E. R. (2016). Information Systems Success Measurement. *Foundations and Trends in Information Systems*, 2(1), 1–116. <https://journal.unesa.ac.id/index.php/jpeka>

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<https://doi.org/10.1561/29000000005>

Delone, W., & McLean, E. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *J. of Management Information Systems*, 19, 9–30.
<https://doi.org/10.1080/07421222.2003.11045748>

Dewi, M. A., Murad, D. F., Inn, A. 'B., Darwis, T., & Udin, N. (2023). Multiple Regression Model in Testing the Effectiveness of LMS After COVID-19. In M. S.C., S. S.M., & W. P.W. (Eds.), *Lecture Notes in Electrical Engineering: Vol. 1029 LNEE* (pp. 937–947). Springer Science and Business Media Deutschland GmbH.
https://doi.org/10.1007/978-3-031-29078-7_81

Do, B.-R., Yeh, P.-W., & Madsen, J. (2016). Exploring the relationship among human resource flexibility, organizational innovation and adaptability culture. *Chinese Management Studies*, 10(4), 657–674. <https://doi.org/10.1108/CMS-01-2016-0022>

Durga, S., Podile, V. R., & Narapareddi, V. (2025). Exploring the factors determining fintech adoption among Indian users integrating Theory of Planned Behaviour (TPB) and Social Learning Theory (SLT). *International Journal of Accounting and Economics Studies*, 12(1), 10–18. <https://doi.org/10.14419/gzyjat18>

Elmunsyah, H., Nafalski, A., Wibawa, A. P., & Dwiyanto, F. A. (2023). Understanding the Impact of a Learning Management System Using a Novel Modified DeLone and McLean Model. In *Education Sciences* (Vol. 13, Issue 3, p. 235).
<https://doi.org/10.3390/educsci13030235>

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021). *Evaluation of Reflective Measurement Models BT - Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R: A Workbook* (J. F. Hair Jr., G. T. M. Hult, C. M. Ringle, M. Sarstedt, N. P. Danks, & S. Ray (eds.); pp. 75–90). Springer International Publishing. https://doi.org/10.1007/978-3-030-80519-7_4

Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a Silver Bullet. *Journal of Marketing Theory and Practice*, 19(2), 139–152. <https://doi.org/10.2753/MTP1069-6679190202>

Hassan, A., Nordin, N., Azmin, A., Al-Nabae, M., & Al-Hosaini, F. (2025). Control VS Flexibility: the Moderating Role of Culture on Leadership and Performance Measurement Relationship Toward SDGs. *Journal of Lifestyle and SDGs Review*, 5, e04127. <https://doi.org/10.47172/2965-730X.SDGsReview.v5.n02.pe04127>

Idkhan, A. M., & Idris, M. M. (2023). The Impact of User Satisfaction in the Use of E-Learning Systems in Higher Education: A CB-SEM Approach. *International Journal of Environment, Engineering and Education*, 5(3), 100–110.
<https://doi.org/10.55151/ijeedu.v5i3.91>

Kim, S. Y., & Kim, J. M. (2025). Standardization versus customization in artificial
<https://journal.unesa.ac.id/index.php/jpeka>

Service Quality and LMS Usage in University: The Mediation Role of User Satisfaction and the Moderating Role of Flexibility-Oriented Culture

intelligence-based services: what fuels continuous intention to use on digital platforms? *Service Business*, 19(1). <https://doi.org/10.1007/s11628-025-00580-8>

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling, Fourth Edition*. Guilford Publications. <https://books.google.co.id/books?id=Q61ECgAAQBAJ>

Langa, M. R., & Moeti, M. N. (2025). Personalized Learning with Generative AI: Revolutionizing Learning Management Systems. In *Smart Innovation, Systems and Technologies* (Vol. 436, pp. 65–84). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-981-96-2124-8_6

Legramante, D., Azevedo, A., & Azevedo, J. M. (2023). Integration of the technology acceptance model and the information systems success model in the analysis of Moodle's satisfaction and continuity of use. *International Journal of Information and Learning Technology*, 40(5), 467–484. <https://doi.org/10.1108/IJILT-12-2022-0231>

Madyatmadja, E. D. (2023). The Effectiveness of Learning Management System for University Students in Indonesia. *Proceedings of the 7th 2023 International Conference on New Media Studies, CONMEDIA 2023*, 88–93. <https://doi.org/10.1109/CONMEDIA60526.2023.10428127>

Mailoor, M., & Tjhin, V. (2025). Evaluating key factors for successful continuous auditing implementation: Insights from an energy and electricity company. *The International Journal of Digital Accounting Research*, 1–33. https://doi.org/10.4192/1577-8517-v25_1

Mansor, A. B. A., & Kulgemeyer, C. (2025). The effect of convenience and self-efficacy on the satisfaction of learning management system usage. *International Journal of Evaluation and Research in Education*, 14(2), 910–917. <https://doi.org/10.11591/ijere.v14i2.32065>

Maurat, J. I. C. (2025). Exploring the Correlation Between User Satisfaction and System Performance in Virtual Laboratories. *2025 16th International Conference on E-Education, E-Business, E-Management and E-Learning, IC4e 2025*, 32–35. <https://doi.org/10.1109/IC4e65071.2025.11075344>

Muhasyah, S., & Suhud, U. (2024). Can a Mandatory Information System Enhance User Satisfaction and Individual Performance within Organization? *Pakistan Journal of Life and Social Sciences*, 22(2), 12623–12634. <https://doi.org/10.57239/PJLSS-2024-22.2.00901>

Mukhtarul Fata An Nadwi, & I Kadek Dwi Nuryana. (2025). User satisfaction analysis of sidia unesa based on perceived usefulness, system, information, and service quality. *Journal of Emerging Information Systems and Business Intelligence (JEISBI)*, 6(2 SE-Articles), 256~266. <https://doi.org/10.26740/jeisbi.v6i2.70637>

Nasution, A. P., & Muda, I. (2025). Delone McLean Model Application for RGIS User <https://journal.unesa.ac.id/index.php/jpeka>

- Satisfaction Assessment in Regional Government. *International Journal of Accounting and Economics Studies*, 12(5), 739–746. <https://doi.org/10.14419/2vca8212>
- Ni, G., Xu, H., Cui, Q., Qiao, Y., Zhang, Z., Li, H., & Hickey, P. J. (2021). Influence Mechanism of Organizational Flexibility on Enterprise Competitiveness: The Mediating Role of Organizational Innovation. In *Sustainability* (Vol. 13, Issue 1, p. 176). <https://doi.org/10.3390/su13010176>
- Ömür, G., Öztırak, D. D. M., Yazıcı, A., Sk, & Çiçeklioğlu, H. (2025). The Effect of Flexible Working Perception, Digital and Agile Organizational Culture on Technology Use: a Study from the Employees' Perspective 1. *Studia Humana*, 14, 41–54. <https://doi.org/10.2478/sh-2025-0007>
- Paa, L., & Ates, N. (2013). Critical success factors of e-learning scenarios for erp end-user training. In *Lecture Notes in Information Systems and Organisation* (Vol. 4, pp. 87–100). Springer Heidelberg. https://doi.org/10.1007/978-3-642-37021-2_8
- Petrovic, A., & Jaksic, D. (2026). Towards Smart and Socially Integrated Learning: A Systematic Review of LMS, Social Media and Artificial Intelligence Synergies. *Electronic Journal of E-Learning*, 24(1), 75–92. <https://doi.org/10.34190/ejel.24.1.4417>
- Pitogo, V. A., Gonzales, E. C., & Jaictin, J. F. P. (2022). PLS-SEM-ANN- Based Technique for Understanding Behavioral Intention to Use a Learning Management System. 2022 *International Conference of Science and Information Technology in Smart Administration*, ICSINTESA 2022, 18–23. <https://doi.org/10.1109/ICSINTESA56431.2022.10041597>
- Prasetya, F. H., Widianoro, A. D., & Harnadi, B. (2023). Effects of Quality Factor and Satisfaction on The Acceptance of Online Learning (Adoption Learning Technology). 7th *International Conference on Information Technology, InCIT 2023*, 98–103. <https://doi.org/10.1109/InCIT60207.2023.10412893>
- Prayogo, S., Lubis, M., & Witarsyah, D. (2025). Toward an Adaptive Learning Information System for Sustainable Higher Education Development Using Feasibility Analysis Based on Financial Parameters. In *Lecture Notes in Networks and Systems* (Vol. 1178, pp. 149–160). Springer Science and Business Media Deutschland GmbH. https://doi.org/10.1007/978-981-97-9559-8_13
- Purnomo, D., Hidayatullah, S., & Prasetya, D. A. (2022). The Influence of System Use and User Satisfaction as a Mediator of System Quality, Information Quality and E-Learning Service Quality on Benefits. *IJRESM*, 5, 1–8.
- Putra, N. P., & Retnowardhani, A. (2024). Unlocking user satisfaction: a delone & mclean is success model approach to it helpdesk ticketing system adoption. *Journal of Applied Engineering and Technological Science*, 6(1), 610–625. <https://doi.org/10.37385/jaets.v6i1.4469>

- Ramadhani, R., Lubis, M., & Saedudin, R. R. (2025). Analyzing Issues and Challenges in Standard LMS Functions and Evaluation Methods. *ICADEIS 2025 - 2025 International Conference on Advancement in Data Science, E-Learning and Information System: Integrating Data Science and Information System, Proceeding*. <https://doi.org/10.1109/ICADEIS65852.2025.10933028>
- Riatun, R., & Lestari, E. (2022). Analysis of the Effect of Information Quality, System Quality, and Support Service Quality on User Satisfaction Levels and Its Implications for Blended E-Learning Continuance Intention to Use in the New Normal Era. *Formosa Journal of Sustainable Research*, 1, 1067–1082. <https://doi.org/10.55927/fjsr.v1i7.2226>
- Saba, P., Delone, W., Ul-Ain, N., Harfouche, A., Nasr, I. B., Biot-Paquerot, G., & Mallek, S. (2025). The DeLone and McLean Information Systems Success Model: What is the Future Evolution for Its Foundations, Components, and Applications? *Communications of the Association for Information Systems*, 57. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-105016369453&partnerID=40&md5=dc89b413461fb1a8575823f45a2972cb>
- Salam, M., & Farooq, M. S. (2020). Does sociability quality of web-based collaborative learning information system influence students' satisfaction and system usage? *International Journal of Educational Technology in Higher Education*, 17(1), 26. <https://doi.org/10.1186/s41239-020-00189-z>
- Simanca Herrera, F. A., Crespo, R. G., Baena, L. R., & Burgos, D. (2019). A Solution to Manage the Full Life Cycle of Learning Analytics in a Learning Management System: AnalyTIC. *Revista Iberoamericana de Tecnologías Del Aprendizaje*, 14(4), 127–134. <https://doi.org/10.1109/RITA.2019.2950148>
- Song, K. (2025). An examination of tax service quality with the use of online tax systems: A structural equation modelling analysis. *Edelweiss Applied Science and Technology*, 9(4), 2157–2163. <https://doi.org/10.55214/25768484.v9i4.6501>
- Supriyatna, A. R., Asrowardi, I., Subyantoro, E., & Putra, S. D. (2026). Implementation of clustering for high availability learning management system (LMS) of Politeknik Negeri Lampung with load balancing method. In *AIP Conference Proceedings* (Vol. 3228, Issue 1). American Institute of Physics. <https://doi.org/10.1063/5.0307667>
- Susilowati, H. (2020). Use E-learning systems: System Quality, Information Quality and Service Quality on User Satisfaction. *Journal of Business Management Review*, 1, 208–222. <https://doi.org/10.47153/jbmr13.352020>
- Teja, P., Jeyaraj, J. R. A., Charan, A. S., Sagar, B. D., & Sai Vignesh, I. V. (2025). Improving Student-Teacher Interaction in Smart Classroom. *16th International Conference on Advances in Computing, Control, and Telecommunication Technologies, ACT 2025*, 2, 12938–12943. <https://www.scopus.com/inward/record.uri?eid=2-s2.0-105034862836&partnerID=40&md5=ef80ccce0439facaef2f802eb6047b37>
<https://journal.unesa.ac.id/index.php/jpeka>

- Ubaidah, U., Budiono, T. A., Darmadi, H., & Sukmono, A. N. (2026). Multi-lens analysis of LMS feature adoption in higher education. *Frontiers in Education*, 10. <https://doi.org/10.3389/feduc.2025.1711393>
- Widyaningrum, T., Sholihah, Q., & Haryono, B. S. (2024). The Delone and McLean Information System Success Model: Investigating User Satisfaction in Learning Management System. *Journal of Education Technology*, 8(1 SE-Articles), 86–94. <https://doi.org/10.23887/jet.v8i1.71080>
- Yadav, M. K., Rai, A. K., & Srivastava, M. (2015). Exploring the three-path mediation model: A study of customer perceived value, customer satisfaction service quality and behavioral intention relationship. In *Web-Based Services: Concepts, Methodologies, Tools, and Applications* (pp. 1328–1349). IGI Global. <https://doi.org/10.4018/978-1-4666-9466-8.ch059>
- Yadav, P., & Bagri, K. (2025). Flexible work culture: prospects and trends through a bibliometric and systematic review. *IIM Ranchi Journal of Management Studies*, 4(2), 183–205. <https://doi.org/10.1108/IRJMS-10-2024-0126>
- Yarlikaş, S., Arpacı, I., & Afacan, G. (2012). User acceptance of eGovernment services: Analysis of users' satisfaction level based on technology acceptance model. In *Industrial Dynamics, Innovation Policy, and Economic Growth through Technological Advancements* (pp. 348–362). IGI Global. <https://doi.org/10.4018/978-1-4666-1978-4.ch018>
- Yuniati, M., Hidayati, L., & Rahayu, I. A. T. (2025). International class teaching materials based on blended learning through the SIDIA learning management system. *AIP Conference Proceedings*, 3354(1), 40008. <https://doi.org/10.1063/5.0292260>

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