Journal of Management Analytical and Solution (JoMAS)
Journal homepage: https://talenta.usu.ac.id/jomas

Information System Quality and Student Satisfaction: An Empirical Analysis of the SATU USU System at Universitas Sumatera Utara

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ARTICLE INFO

Article history:
Received: 10 November 2025
Revised: 20 December 2025
Accepted: 10 January 2026
Available online: 30 January 2026

E-ISSN: 2776-6276
P-ISSN: -

How to cite:
Putra, A.F., Juniarsih, T, "Information System Quality and Student Satisfaction: An Empirical Analysis of the SATU USU System at Universitas Sumatera Utara," Journal of Management Analytical and Solution (JoMAS), Vol. 6, No. 1, January. 2026, doi: doi.org/10.32734/jomas.v6i1.24785

ABSTRACT

This study investigates the influence of information quality within the SATU USU academic information system on student satisfaction at the Faculty of Vocational Studies, Universitas Sumatera Utara. The research employs a quantitative approach using Partial Least Squares–Structural Equation Modeling (PLS-SEM) to analyze the relationship between information quality and student satisfaction. A total of 105 respondents were selected from a population of 2,500 active students using the Slovin formula with a 10% margin of error. Information quality was measured through five indicators: accuracy, completeness, relevance, clarity, and timeliness. Student satisfaction was assessed using indicators of ease of use, interface satisfaction, perceived usefulness, system suitability, and overall satisfaction. The measurement model results demonstrate strong validity and reliability, indicated by outer loading values exceeding 0.70, Average Variance Extracted (AVE) values above 0.50, and composite reliability values greater than 0.90. The structural model analysis shows an R-square value of 0.802, indicating that information quality explains a substantial proportion of the variance in student satisfaction. Bootstrapping results confirm a significant positive effect of information quality on student satisfaction ($\beta = 0.896$; $t = 30.165$; $p < 0.001$). These findings highlight the critical role of high-quality information in improving user satisfaction with academic information systems in higher education institutions.

Keywords: Information Quality; Student Satisfaction; Academic Information Systems; Higher Education Management; PLS-SEM

1. INTRODUCTION

The rapid evolution of information technology in the digital age has prompted higher education institutions to enhance the delivery of academic services so they become more efficient, precise, and accessible. At Universitas Sumatera Utara, the SATU USU system was developed as an integrated platform designed to accommodate these demands. Through this system, students can manage essential academic activities, including course registration (KRS), accessing grades, monitoring attendance, and tracking administrative processes in real time. For students of the Faculty of Vocational Studies, the platform plays a vital role, as their learning environment characterized by intensive practical work and structured schedules, requires information that is accurate, relevant, and consistently updated.

Various empirical studies indicate that information quality within academic systems has a substantial impact on user satisfaction. Abbas (2013) explains that elements such as clear navigation and fast information access on academic websites significantly shape students' satisfaction levels. This perspective aligns with the SATU USU context, where reliability and ease of access to information are central to system effectiveness. Furthermore, Gultom, Ginting, and Sembiring (2014) argue that both service quality and information quality meaningfully influence students' satisfaction with educational institutions. This is particularly pertinent for Vocational Studies students, who depend on clear and comprehensible academic information to ensure smooth administrative procedures.

Support for this argument is also provided by Nurendah and Mulyana (2013), who assert that service quality including the timely and accurate delivery of information, strongly affects students' positive evaluations of academic

services. Additional studies on academic information systems reinforce the view that information quality is a critical determinant of user satisfaction. Mustopa et al. (2020), for example, identify information quality as a principal factor in evaluating satisfaction with academic service websites. This finding is especially relevant to SATU USU, given that Vocational Studies students rely heavily on the clarity and punctuality of system-generated information. In a similar vein, Rifad (2022) emphasizes that the effectiveness of educational management information systems depends largely on how well the information provided contributes to overall educational efficiency. Research conducted at other universities further supports this conclusion. Sihombing (2024) demonstrates that management information systems significantly enhance lecture effectiveness when the information presented is accessible and credible. Likewise, Tamher and Widiastono (2024) reveal that the quality of academic and financial information systems has a notable impact on the quality of student services. Collectively, these studies confirm that improvements in information quality are closely associated with higher levels of student satisfaction.

Drawing on these findings, it can be inferred that information quality serves as a fundamental determinant of student satisfaction in academic service contexts. Accordingly, this study seeks to examine the extent to which information quality within the SATU USU system affects student satisfaction in the Faculty of Vocational Studies. The outcomes of this research are expected to provide empirical evidence regarding the system's effectiveness in delivering essential academic information and to contribute to the continuous improvement of academic services at both faculty and university levels.

2. METHODS

This research adopts a quantitative design utilizing the Partial Least Squares–Structural Equation Modeling (PLS-SEM) technique. The PLS-SEM approach was selected due to its suitability for predictive analysis, examination of causal relationships, and assessment of complex latent constructs, particularly when working with relatively limited sample sizes. The study population comprises 2,500 active students from the Faculty of Vocational Studies at Universitas Sumatera Utara. By applying the Slovin formula with a 10% margin of error, a sample of 105 respondents was obtained, which is considered adequate to represent the overall population. The study focuses on two primary constructs: information quality as the independent variable and student satisfaction as the dependent variable. Information quality is operationalized through five principal dimensions (accuracy, completeness, relevance, clarity, and timeliness) which represent the essential attributes of information within the SATU USU system. In contrast, student satisfaction is measured using five indicators that reflect users' evaluative responses toward the system, namely ease of use, satisfaction with the interface, perceived usefulness, system compatibility, and overall satisfaction. Data collection was conducted through a structured questionnaire employing a five-point Likert scale ranging from "strongly disagree" to "strongly agree." The instrument was designed to capture students' perceptions of both the quality of information delivered by SATU USU and their satisfaction in utilizing the platform. The collected data were processed using SmartPLS 3.0 through a sequence of analytical procedures. First, the measurement model (outer model) was evaluated to examine convergent validity, Average Variance Extracted (AVE), and composite reliability. Subsequently, the structural model (inner model) was assessed to determine the R-square value, path coefficients, and effect sizes. Finally, the bootstrapping method was applied to test the statistical significance of the relationships between the constructs included in the model.

3. RESULTS AND DISCUSSIONS

This section provides a detailed description of the findings derived from the data analysis using SmartPLS 3. The analytical procedures were carried out to evaluate the extent to which information quality within the SATU USU system influences the satisfaction levels of students in the Faculty of Vocational Studies. The results are organized systematically, beginning with an assessment of the measurement model to verify the validity and reliability of the indicators. This is followed by an examination of the structural model to determine the magnitude and direction of the relationships between the variables. After completing these stages, an in-depth discussion is presented to interpret the empirical significance of the results and to explain their broader implications.

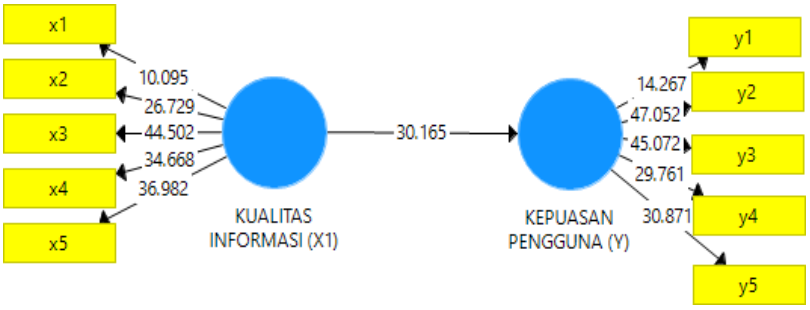

Figure 1. Diagram of the SmartPLS-SEM Research Model.

The SmartPLS diagram serves as a graphical depiction of the causal linkage between two principal constructs: information quality as the exogenous variable and user satisfaction as the endogenous variable. Each construct is represented by five indicators, with x1–x5 reflecting information quality and y1–y5 representing user satisfaction. The arrow connecting the two constructs illustrates the direct effect examined through path analysis. Because the model is relatively straightforward, the analysis can concentrate fully on evaluating how strongly information quality influences user satisfaction. Although the framework does not incorporate additional variables, it offers a clear understanding of both the direction and magnitude of the relationship under investigation. This streamlined structure is particularly appropriate for research on academic information systems, as it enables more focused assessment of measurement indicators and more precise testing of causal effects. The evaluation of the measurement model was conducted using two primary procedures: the PLS Algorithm and Bootstrapping. The PLS Algorithm was applied to calculate the outer loading values of each indicator in order to assess convergent validity and the reliability of the constructs. Bootstrapping, on the other hand, was utilized to determine the statistical significance of the relationships among variables, analyze the strength of the path coefficients, and strengthen the empirical support for the study's conclusions.

The findings from the convergent validity assessment reveal that all indicators achieved outer loading values above 0.70. This outcome indicates that each questionnaire item reliably measures its corresponding construct. Therefore, the measurement model demonstrates adequate validity and reliability, providing a solid basis for proceeding to the structural model analysis.

Table 1. Outer Loading Values

No	Indicator	Loading
1	X1	0.802
2	X2	0.867
3	X3	0.904
4	X4	0.885
5	X5	0.900
6	Y1	0.848
7	Y2	0.903
8	Y3	0.920
9	Y4	0.904
10	Y5	0.900

Referring to Table 1, all indicators associated with the Information Quality (X) and Student Satisfaction (Y) constructs show outer loading values exceeding 0.70. The highest loading is recorded for indicator Y3 at 0.920, whereas the lowest appears for indicator Y1 at 0.848. Even so, each value remains comfortably above the required minimum threshold, indicating that every indicator contributes substantially to representing its respective latent construct. These findings confirm that the indicators consistently and accurately reflect their underlying variables, thereby satisfying the requirements for convergent validity. As a result, all indicators are considered suitable for continued analysis within the PLS-SEM framework.

In addition, the Average Variance Extracted (AVE) was calculated to evaluate how much of the variance in the indicators is accounted for by each construct. An AVE value above 0.50 is regarded as acceptable, as it signifies that the construct explains more than half of the variance of its indicators. Composite Reliability (CR) was also assessed to measure internal consistency, with 0.70 serving as the minimum acceptable value and scores exceeding 0.90 indicating a very high level of reliability. The detailed outcomes of these assessments are summarized in Table 2.

Table 2. AVE and Composite Reliability Values

Construct	Ave	Composite Reliability
Information Quality	0.761	0.941
Student Satisfaction	0.801	0.953

Both constructs exhibit a high level of reliability, as indicated by Composite Reliability (CR) scores above 0.90. Likewise, the AVE values for each construct are greater than 0.50, demonstrating that more than half of the variance in the indicators is accounted for by their corresponding constructs. Taken together, these findings verify that the measurement model satisfies the established criteria for validity and reliability. With these requirements fulfilled, the model provides a robust basis for advancing to the structural model evaluation phase.

3.1 Structural Model

The analysis was conducted to assess the extent to which information quality influences user satisfaction. The estimation results indicate that the user satisfaction variable has an R- Square value of 0.802.

Table 3. R-Square Values

Variable	R-Square
User Satisfaction (Y)	0.802

This result shows that information quality accounts for 80.2% of the variance in student satisfaction regarding the use of the SATU USU system. Such a proportion is categorized as strong, indicating that information quality plays a major role in influencing user satisfaction. In addition, the bootstrapping analysis confirms that the relationship between the two variables is statistically significant.

Table 4. Path Coefficients

Relationship	Coefficient	t-statistic	p-value
X1-Y	0.896	30.165	0.000

The path coefficient of 0.896 indicates that an increase in information quality is likely to be followed by an increase in student satisfaction. The very high t-value and a p-value below 0.05 further strengthen the evidence that this effect is statistically significant.

3.2 Discussions

The findings of this research reveal that information quality plays a dominant role in determining students' satisfaction with the use of the SATU USU system. The results suggest that students assess the platform not solely based on its technical functionality, but also on how well the information is structured, regularly updated, and aligned with their academic requirements. In this regard, information quality emerges as a central factor influencing students' overall experience when engaging with a digital academic platform. The strong effect of information quality on satisfaction underscores the importance of prioritizing accurate content, clear presentation, and transparent data management in the development of educational information systems. These results align with earlier studies that position information quality as a key determinant of system success. At the same time, this study offers additional insight by concentrating on a specific faculty within a public university and examining an integrated system that is consistently used by the entire student body. The substantial R-square value further indicates that other variables beyond information quality contribute only marginally to student satisfaction. This suggests that users place greater emphasis on the quality of the information they receive than on technical features or visual design elements. Consequently, enhancing the substance and reliability of the information provided is likely to produce a more meaningful improvement than making superficial interface modifications to the SATU USU system. In summary, the study confirms that information quality should not be viewed as a secondary element, but rather as a fundamental component that significantly shapes user satisfaction with the SATU USU academic information system.

4. CONCLUSIONS

The results of this research show that the quality of information provided within the SATU USU system significantly shapes how students assess their experience when using the platform. When the information is precise, clearly presented, complete, easy to comprehend, and regularly updated, students are more likely to feel confident and assured in handling their academic responsibilities. These findings highlight that satisfaction is driven not merely by advanced technology or attractive interface design, but more importantly by how effectively the information fulfills students' academic needs. Observations in the field further indicate that students are highly responsive to even slight variations in information quality. Delays in updating data or ambiguities in information presentation can quickly diminish their sense of convenience and trust. In contrast, information that is systematically organized and directly relevant contributes positively to the efficiency of their academic activities. This underscores that information quality is a strategic factor and a key determinant in maintaining the effectiveness of digital academic systems such as SATU USU. While the study offers a thorough analysis, there remains room for further exploration. Future research could incorporate additional variables, such as service quality, overall user experience, or specific technical characteristics of the system, to broaden the scope of analysis. Including these elements may lead to a more comprehensive understanding of the determinants of student satisfaction with academic information systems. Moreover, applying a qualitative approach could provide deeper insight into students' lived experiences and perceptions when interacting with SATU USU.

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