



The Influence of Academic Information Systems on Student Satisfaction in the Learning Process and Improving Student Academic Quality at the Mojosari Institute of Technology in Nganjuk

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Abstract

Technology-Supported Academic Information Systems have become an essential component of digital transformation in higher education by facilitating technology-enhanced learning environments and improving academic services. This study investigates the association of Technology-Supported Academic Information Systems on Student Learning Satisfaction and Student Academic Quality at the Mojosari Institute of Technology, Nganjuk. A quantitative correlational survey design was employed involving 222 students selected from a population of 500 active students using probability sampling. Data were collected through a five-point Likert-scale questionnaire administered via Google Forms and analyzed using IBM SPSS through validity and reliability testing, classical assumption testing, simple linear regression, t-tests, and coefficient of determination analysis. The findings reveal that Technology-Supported Academic Information Systems have a positive and significant effect on Student Learning Satisfaction ($\beta = 1.089$, $p < 0.001$; $R^2 = 0.590$) and Student Academic Quality ($\beta = 0.481$, $p < 0.001$; $R^2 = 0.387$). These results indicate that well-designed digital academic systems contribute substantially to students' learning experiences while supporting academic development within higher education. The study extends existing literature by repositioning Academic Information Systems as technology-supported learning infrastructure rather than merely administrative platforms, highlighting their strategic role in strengthening institutional digital transformation and improving educational quality.

Keywords: Academic Information Systems; Higher Education; Student Academic Quality; Student Learning Satisfaction; Technology-Supported Learning.

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INTRODUCTION

The rapid advancement of digital technology has transformed higher education by reshaping the ways institutions deliver academic services and support student learning. Rather than functioning solely as administrative tools, digital technologies have become an integral part of technology-supported learning environments that facilitate access to academic resources, communication, learning management, and student engagement. In this context, Academic Information Systems (AIS) play a strategic role in integrating academic administration with technology-enabled educational services, allowing students to access learning-related information efficiently while supporting the continuity of academic activities. The successful integration of digital technologies into higher

education depends not only on technological infrastructure but also on students' digital capabilities, engagement, and the extent to which technology contributes to meaningful academic experiences (Getenet et al., 2024; Kayyali, 2024; Smith & Storrs, 2023).

Technology-supported learning emphasizes the use of digital systems to create more accessible, responsive, and learner-centered educational environments. Academic Information Systems are increasingly recognized as an important component of this ecosystem because they provide students with timely access to course registration, academic schedules, assessment results, learning progress, and institutional services through integrated digital platforms. Such technological support enables students to manage their academic activities more independently while improving communication between students, lecturers, and academic administrators. The integration of academic information systems with other digital learning platforms further demonstrates their potential to support a more connected and effective technology-enhanced educational environment (Doctor, 2022; Ramadhan et al., 2024; Widyaningrum et al., 2024).

Student satisfaction has become an essential indicator for evaluating the quality of technology-supported educational services in higher education. Student satisfaction reflects students' perceptions of whether digital academic services meet their academic needs and expectations throughout the learning process. Previous research indicates that the quality of academic information systems, information provision, and service delivery plays an important role in shaping students' perceptions and satisfaction. Systems that are accessible, reliable, responsive, and capable of providing appropriate academic information are more likely to generate positive experiences among students and strengthen their perceptions of institutional service quality (Aman et al., 2023; Anam et al., 2023; Cahyadi et al., 2023; Zahara & Rahmah, 2023).

Beyond improving satisfaction, digital academic systems can contribute to academic quality by supporting more efficient academic planning, access to institutional information, monitoring of learning activities, and timely academic decision-making. Students who can readily access academic information are better positioned to organize their academic responsibilities, comply with institutional requirements, and respond to academic information in a timely manner. In this regard, Academic Information Systems should not be viewed merely as administrative applications but as part of the technological infrastructure that supports academic processes and the broader quality of higher education services (Damasar et al., 2025; Mukminin et al., 2019).

The effectiveness of Academic Information Systems is closely related to the quality of the system and services experienced by students. Studies conducted in different higher education contexts have shown that the quality of academic information systems can significantly influence student satisfaction. Fauzi (2023), Jahruddin et al. (2023), Mahendra et al. (2024), and Pauji et al. (2024) found that students' satisfaction with academic information systems is associated with the performance, accessibility, and quality of digital academic services. These findings reinforce the view that effective technology-supported academic systems can improve students' experiences in interacting with university academic services.

The relationship between system quality, service quality, and student satisfaction can also be understood through established information system success perspectives. Gurendrawati et al. (2022) demonstrated the relevance of the DeLone and McLean Information System Success Model for explaining user satisfaction in academic service systems. Similar evidence suggests that the quality of academic information systems and institutional services contributes meaningfully to students' overall satisfaction with technology-supported academic services (Purwati et al., 2025; Widyaningrum et al., 2024). In addition, the broader quality of the learning process remains an important dimension of student satisfaction, indicating that technological services need to be considered in relation to students' overall academic experiences (Rahmawati et al., 2023).

Despite the growing body of literature, previous studies have predominantly examined Academic Information Systems from the perspective of administrative service quality, information system performance, and user satisfaction. Studies have generally focused on how system quality, information quality, accessibility, and service quality influence users' evaluation of digital academic services (Cahyadi et al., 2023; Gurendrawati et al., 2022; Purwati et al., 2025). Comparatively limited

attention has been given to understanding Academic Information Systems as educational technology infrastructure that simultaneously supports student learning satisfaction and academic quality within technology-supported learning environments. This limitation indicates a need to extend the discussion of Academic Information Systems beyond administrative efficiency and toward their broader contribution to students' educational experiences.

This issue is particularly relevant in the context of private higher education institutions in Indonesia, where digital transformation is increasingly intertwined with institutional efforts to strengthen educational services and improve student satisfaction. Existing Indonesian studies have demonstrated the importance of Academic Information System quality in determining student satisfaction across various institutional contexts (Anam et al., 2023; Fauzi, 2023; Jahruddin et al., 2023; Mahendra et al., 2024). However, evidence remains limited regarding the extent to which technology-supported Academic Information Systems contribute simultaneously to students' learning satisfaction and academic quality as interconnected educational outcomes.

The Mojosari Institute of Technology, Nganjuk, has implemented an Academic Information System to facilitate various academic activities, including course registration, class scheduling, grade reporting, and academic administration. Although the system has become an essential component of institutional digital services, empirical evidence regarding its contribution to students' learning satisfaction and academic quality remains limited. Understanding these relationships is important for evaluating whether the implementation of technology-supported academic systems contributes not only to administrative efficiency but also to the quality of students' academic experiences and educational outcomes.

Therefore, this study aims to analyze the influence of Technology-Supported Academic Information Systems on student learning satisfaction and student academic quality at the Mojosari Institute of Technology, Nganjuk. By integrating perspectives on information system quality, technology-supported learning, and student satisfaction, this study is expected to contribute to the growing literature on educational technology and academic information systems. More specifically, the findings are expected to provide empirical evidence regarding the role of Academic Information Systems as technology-supported academic infrastructure that can strengthen student learning satisfaction and academic quality in higher education.

RESEARCH METHODS

This study employed a quantitative correlational survey design to examine the relationship between Technology-Supported Academic Information Systems (TSAIS) and two student-related outcomes: Student Learning Satisfaction and Student Academic Quality. Data were collected through a structured questionnaire and analyzed statistically to determine the direction, significance, and explanatory power of the relationships between the variables (Creswell, J. W., & Creswell, D., 2018). The methodological procedures included research design, research subjects, data collection, instrument evaluation, and statistical analysis.

Research Design

A quantitative correlational survey design was used because the study aimed to examine the statistical influence of Technology-Supported Academic Information Systems on Student Learning Satisfaction and Student Academic Quality without manipulating the learning environment. The study conceptualized TSAIS as technology-supported academic infrastructure that students use in their academic and learning-related activities.

The study examined one independent variable, Technology-Supported Academic Information Systems (X), and two dependent variables: Student Learning Satisfaction (Y₁) and Student Academic Quality (Y₂). Accordingly, two simple linear regression models were specified:

$$Y_1 = \alpha + bX$$

where Y₁ represents Student Learning Satisfaction, and

$$Y_2 = \alpha + bX$$

where Y_2 represents Student Academic Quality.

The design was therefore used to determine whether variations in students' perceptions of TSAIS were statistically associated with variations in their learning satisfaction and academic quality.

Research Subject

The study was conducted at the Mojosari Institute of Technology, Nganjuk, Indonesia. The population consisted of 500 active students who were attending lectures during the research period. The students were considered appropriate research subjects because they had direct experience using the institution's Academic Information System in their academic activities and learning processes. A total of 222 students participated in the study. The sample size was determined using the Slovin formula with a 5% margin of error:

$$n = \frac{N}{1 + Ne^2}$$

Where $N=500$ and $e=0.05$, resulting in approximately 222 respondents. The respondents were selected using probability sampling, giving members of the population an opportunity to participate in the study.

The respondents' direct experience with the Academic Information System was important because the study evaluated the system from the perspective of students as its users and examined its relationship with their learning satisfaction and academic quality.

Research Procedure

The research was conducted through four main stages. First, the researchers identified the research variables and developed the conceptual relationship between Technology-Supported Academic Information Systems, Student Learning Satisfaction, and Student Academic Quality based on relevant literature and previous empirical studies.

Second, a structured questionnaire was prepared to measure the three variables. The instrument consisted of 10 items for Technology-Supported Academic Information Systems, 14 items for Student Learning Satisfaction, and 8 items for Student Academic Quality, resulting in 32 questionnaire items. The questionnaire used a five-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The original study confirms the use of a Google Forms-based questionnaire and a 1–5 Likert scale.

Third, data were collected from the selected respondents through the questionnaire. The responses were subsequently organized and prepared for statistical analysis.

Fourth, the collected data were analyzed using IBM SPSS. Instrument validity and reliability were examined before testing the regression assumptions and estimating the two regression models. The research procedure is summarized in Figure 1.

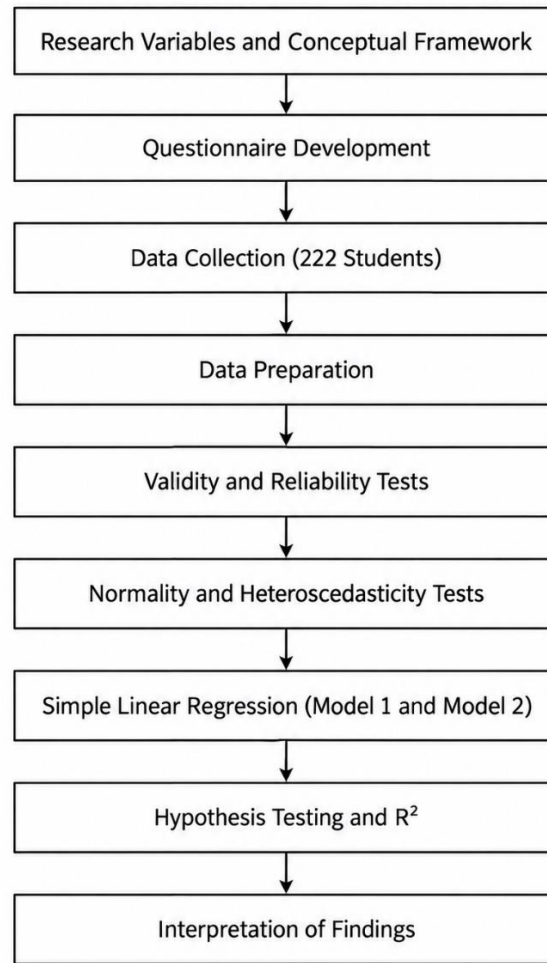


Figure 1. Research Procedure

Instruments and Data Collection Techniques

The research instrument was a structured questionnaire designed to measure three constructs: Technology-Supported Academic Information Systems (X), Student Learning Satisfaction (Y₁), and Student Academic Quality (Y₂). The questionnaire items were developed with reference to relevant theories and previous studies and were adapted to the higher education context. The original manuscript confirms that the instrument was designed to measure students' perceptions of the quality of the academic information system, their satisfaction during the learning process, and academic experiences related to academic quality. The instrument composition is presented in Table 1.

Table 1. Research instrument structure

Variable	Code	Number of Items	Measurement Scale
Technology-Supported Academic Information Systems	X	10	5-point Likert
Student Learning Satisfaction	Y ₁	14	5-point Likert
Student Academic Quality	Y ₂	8	5-point Likert
Total		32	

The questionnaire was distributed using Google Forms. Respondents rated each statement using a five-point Likert scale from 1 = Strongly Disagree to 5 = Strongly Agree. The use of an online questionnaire was consistent with the digital context of the research and enabled the collection of responses from students who routinely interacted with the institution's digital academic system.

Before the main statistical analysis, the quality of the questionnaire was assessed through Pearson Product–Moment validity testing and Cronbach's Alpha reliability testing. The validity test examined whether each item adequately represented its respective variable, while the reliability test evaluated the internal consistency of the items. The reported Results confirm that all questionnaire items were valid and that all three constructs achieved Cronbach's Alpha values above 0.70.

Data Analysis Technique

The collected data were analyzed using IBM SPSS through a sequential statistical procedure. First, descriptive data preparation and instrument testing were conducted. Second, the assumptions required for regression analysis were examined using Kolmogorov–Smirnov normality testing and the Glejser heteroscedasticity test. These were the assumption tests reported in the empirical results.

Third, simple linear regression analysis was conducted separately for the two dependent variables. Model 1 examined the relationship between Technology-Supported Academic Information Systems and Student Learning Satisfaction, whereas Model 2 examined the relationship between Technology-Supported Academic Information Systems and Student Academic Quality. The use of simple linear regression is consistent with the study's single-predictor structure and the regression results reported in the manuscript.

The significance of each regression coefficient was evaluated using the t-test at a significance level of 0.05. A significance value below 0.05 was interpreted as evidence of a statistically significant relationship (Hair et al., 2019). Finally, the coefficient of determination (R^2) was used to determine the proportion of variance in each dependent variable explained by Technology-Supported Academic Information Systems. The complete analytical sequence is presented in Table 2.

Table 2. Data analysis procedures

Analytical Stage	Technique	Purpose
1	Data preparation	Organize questionnaire responses for analysis
2	Pearson Product–Moment	Test item validity
3	Cronbach's Alpha	Test instrument reliability
4	Kolmogorov–Smirnov	Test residual normality
5	Glejser Test	Test heteroscedasticity
6	Simple Linear Regression Model 1	Examine TSAIS → Student Learning Satisfaction
7	Simple Linear Regression Model 2	Examine TSAIS → Student Academic Quality
8	t-test	Test the significance of regression coefficients
9	R^2	Determine explanatory power of each model

The analytical procedure therefore provides a direct methodological link between the research objectives and the reported empirical findings. Importantly, the analysis does not claim that TSAIS is the sole determinant of either outcome. Rather, the regression models estimate its statistical contribution to Student Learning Satisfaction and Student Academic Quality within the studied higher education context.

RESULTS AND DISCUSSION

RESULTS

This section presents the empirical findings of the study on the relationship between TSAIS, Student Learning Satisfaction, and Student Academic Quality. The analysis was conducted in four stages: measurement instrument evaluation, classical assumption testing, and estimation of two simple linear regression models. The first model examined the relationship between TSAIS and Student Learning Satisfaction, while the second examined its relationship with Student Academic Quality. All analyses were based on responses from 222 students.

Measurement Instrument Evaluation

The measurement instruments were first evaluated to determine whether the questionnaire items adequately measured the three research constructs. Validity was assessed using the Pearson Product–Moment correlation, with an r -table value of 0.131. An item was considered valid when its calculated r exceeded the critical value and its significance value was below 0.05.

Table 3. Validity Test of Technology-Supported Academic Information Systems

Item	r	Sig.	Decision
S1	0.707	<0.001	Valid
S2	0.706	<0.001	Valid
S3	0.678	<0.001	Valid
S4	0.658	<0.001	Valid
S5	0.712	<0.001	Valid
S6	0.728	<0.001	Valid
S7	0.695	<0.001	Valid
S8	0.627	<0.001	Valid
S9	0.675	<0.001	Valid
S10	0.535	<0.001	Valid

All ten TSAIS items had calculated r values above 0.131 and significance values below 0.05. Thus, all items were considered valid for measuring students' perceptions of Technology-Supported Academic Information Systems.

Table 4. Validity test of student learning satisfaction

Item	r	Sig.	Decision
K1	0.643	<0.001	Valid
K2	0.691	<0.001	Valid
K3	0.672	<0.001	Valid
K4	0.712	<0.001	Valid
K5	0.696	<0.001	Valid
K6	0.796	<0.001	Valid
K7	0.703	<0.001	Valid
K8	0.780	<0.001	Valid
K9	0.639	<0.001	Valid
K10	0.691	<0.001	Valid
K11	0.730	<0.001	Valid
K12	0.698	<0.001	Valid
K13	0.716	<0.001	Valid
K14	0.716	<0.001	Valid

All 14 Student Learning Satisfaction items were valid because their calculated r values exceeded 0.131 and their significance values were below 0.05.

Table 5. Validity test of student academic quality

Item	r	Sig.	Decision
M1	0.697	<0.001	Valid
M2	0.692	<0.001	Valid
M3	0.701	<0.001	Valid
M4	0.709	<0.001	Valid
M5	0.624	<0.001	Valid
M6	0.652	<0.001	Valid
M7	0.700	<0.001	Valid
M8	0.641	<0.001	Valid

All eight Student Academic Quality items were also valid, with calculated r values above 0.131 and significance values below 0.05. The reliability test was subsequently conducted using Cronbach's Alpha. As shown in Table 6, all three constructs obtained values above the commonly used threshold of 0.70.

Table 6. Reliability test

Construct	Cronbach's Alpha	Items	Decision
Technology-Supported Academic Information Systems	0.862	10	Reliable
Student Learning Satisfaction	0.922	14	Reliable
Student Academic Quality	0.829	8	Reliable

The results indicate good internal consistency across all constructs. Student Learning Satisfaction obtained the highest reliability coefficient (0.922), followed by TSAIS (0.862) and Student Academic Quality (0.829). Therefore, all questionnaire constructs were considered reliable for subsequent analysis.

Classical Assumption Testing

Before estimating the regression models, normality and heteroscedasticity tests were conducted. These tests were applied to ensure that the regression models met the relevant assumptions for subsequent statistical analysis. The normality of the residuals was examined using the Kolmogorov–Smirnov test.

Table 7. Normality test

Statistic	Model 1: Student Learning Satisfaction	Model 2: Student Academic Quality
N	222	222
Test Statistic	0.041	0.046
Asymp. Sig. (2-tailed)	0.200	0.087
Decision	Normal	Normal

The significance values were 0.200 for Model 1 and 0.087 for Model 2, both exceeding 0.05. Thus, the residuals of both regression models were normally distributed. Heteroscedasticity was examined using the Glejser test. The results are presented in Table 8.

Table 8. Heteroscedasticity test

Regression Model	Predictor	Sig.	Decision
Model 1: Student Learning Satisfaction	TSAIS	0.367	No heteroscedasticity
Model 2: Student Academic Quality	TSAIS	0.157	No heteroscedasticity

The significance values were 0.367 for Model 1 and 0.157 for Model 2. Both values were greater than 0.05, indicating that neither regression model exhibited heteroscedasticity. The results of the normality and heteroscedasticity tests indicate that both regression models met the relevant assumptions for further analysis.

Effects of Technology-Supported Academic Information Systems on Student Learning Satisfaction

A simple linear regression analysis was conducted to examine the relationship between Technology-Supported Academic Information Systems and Student Learning Satisfaction. The regression results are presented in Table 9.

Table 9. Simple linear regression results

Regression Model	Constant (a)	Regression Coefficient (b)	Regression Equation
Student Learning Satisfaction	12.007	1.089	$Y_1 = 12.007 + 1.089X$
Student Academic Quality	12.171	0.481	$Y_2 = 12.171 + 0.481X$

Model 1, the regression equation was $Y_1 = 12.007 + 1.089X$. The positive coefficient indicates a positive statistical relationship between Technology-Supported Academic Information Systems and Student Learning Satisfaction. The significance of the regression coefficient was then examined using the *t*-test.

Table 10. Significance test of regression coefficients

Regression Model	<i>t</i>	Sig.	Decision
Student Learning Satisfaction	17.807	<0.001	Significant
Student Academic Quality	11.778	<0.001	Significant

Model 1, the *t* value was **17.807** with $p < 0.001$. Because the significance value was below 0.05, Technology-Supported Academic Information Systems had a statistically significant positive relationship with Student Learning Satisfaction. The explanatory power of the model was assessed using the coefficient of determination.

Table 11. Coefficient of determination

Regression Model	R	R²	Adjusted R²
Student Learning Satisfaction	0.768	0.590	0.589
Student Academic Quality	0.622	0.387	0.384

For Student Learning Satisfaction, $R^2 = 0.590$, indicating that TSAIS statistically explains 59.0% of the variance in Student Learning Satisfaction, while the remaining 41.0% is associated with factors outside the model.

Effects of Technology-Supported Academic Information Systems on Student Academic Quality

The second regression model examined the relationship between Technology-Supported Academic Information Systems and Student Academic Quality. The regression equation was $Y_2 = 12.171 + 0.481X$. The positive regression coefficient ($b = 0.481$) indicates a positive statistical relationship between TSAIS and Student Academic Quality. The *t*-test produced a value of 11.778 with $p < 0.001$. Therefore, the relationship between Technology-Supported Academic Information Systems and Student Academic Quality was statistically significant.

The coefficient of determination for Model 2 was $R^2 = 0.387$, indicating that TSAIS statistically explains 38.7% of the variance in Student Academic Quality, while the remaining 61.3% is associated with other factors not included in the model. Taken together, the two regression models show that Technology-Supported Academic Information Systems have statistically significant positive relationships with both outcomes. The explanatory power is higher for Student Learning Satisfaction ($R^2 = 0.590$) than for Student Academic Quality ($R^2 = 0.387$). This difference provides an important basis for the subsequent Discussion, particularly in interpreting the stronger relationship between technology-supported academic infrastructure and students' learning experiences compared with the broader construct of academic quality.

DISCUSSION

The findings demonstrate that TSAIS have statistically significant positive relationships with both Student Learning Satisfaction and Student Academic Quality. The first regression model produced a regression coefficient of 1.089, a *t* value of 17.807, and $p < 0.001$, with an R^2 of 0.590. The second model produced a regression coefficient of 0.481, a *t* value of 11.778, and $p < 0.001$, with an R^2 of 0.387. These findings indicate that technology-supported academic infrastructure is relevant to students' academic experiences, although its explanatory contribution differs across outcomes. The stronger explanatory power for Student Learning Satisfaction suggests that the effects of digital academic infrastructure may be more immediate at the level of students' day-to-day learning experiences, whereas Student Academic Quality represents a broader outcome shaped by multiple educational and institutional conditions. This distinction is important for positioning the findings within Educational Technology rather than interpreting them solely through an academic service-management perspective.

The significant relationship between TSAIS and Student Learning Satisfaction indicates that the quality and functionality of technology-supported academic infrastructure are closely associated with how students perceive their academic and learning experiences. The regression coefficient of 1.089 indicates a positive direction, while the R^2 value of 0.590 shows that TSAIS statistically explains 59.0% of the variance in Student Learning Satisfaction. This finding is consistent with Rahayu (2022), who examined the relationship between the quality of an Academic Information System and student satisfaction. Similar evidence was reported by Asyifa (2021), who identified system quality, information quality, service quality, and ease of use as important dimensions associated with users' satisfaction with an academic information system. Israr and Ajidin (2022) likewise demonstrated that system quality, information quality, and academic service quality are related to student satisfaction. Collectively, these findings reinforce the proposition that students' evaluations of digital academic systems are influenced not only by whether such systems are available but also by the quality of the technological and informational experience they provide.

From an Educational Technology perspective, student satisfaction should not be interpreted merely as a response to administrative convenience. Students' interactions with institutional digital systems constitute part of their broader academic experience because these technologies mediate access to information, academic procedures, and institutional services. Martasubrata and Suwatno (2016) identified academic service quality as an important determinant of student satisfaction, suggesting that students' perceptions of institutional support are closely related to the quality of services they experience. More recently, De-Juan-Vigaray (2024) emphasized the relationship between student satisfaction, institutional support, and capacity development in higher education. Aulia et al. (2024) also highlighted students' perceptions of academic information system service quality as an important consideration in evaluating digital academic services. The current findings therefore suggest that TSAIS can contribute to a more accessible and responsive academic environment by reducing informational barriers and supporting more predictable interactions with institutional academic processes.

The educational relevance of TSAIS can also be understood through students' direct experiences in using academic information systems. Anggraini et al. (2020), through an analysis using the System Usability Scale, demonstrated the importance of usability in evaluating student academic information systems. Usability is particularly relevant because students regularly interact with these systems to access schedules, grades, registration services, and other academic information. Similarly, Azzahra and Hadiono (2022) evaluated academic information system services through a student-satisfaction-oriented SERVQUAL approach, illustrating the importance of service performance in shaping users' perceptions of digital systems. Kartini (2024) further examined student satisfaction with academic information systems, reinforcing the view that the effectiveness of institutional technology is closely connected with how students experience the system. These studies provide empirical support for interpreting TSAIS as a technology-mediated environment that can shape students' learning-related experiences.

The present results are also consistent with studies examining the performance and quality of academic information systems in different institutional contexts. Fadhilah (2021) investigated the performance of academic information system quality, demonstrating the relevance of system performance in evaluating institutional digital services. Marzuki and Sani (2024) similarly reported an association between the quality of an Academic Information System application and student satisfaction. Ernawati (2024) found that application service quality was related to postgraduate student satisfaction, further emphasizing that students' experiences with digital institutional services depend significantly on how reliably and effectively those services are delivered. In addition, Fauzi (2022) reported that Academic Information System quality and service performance influence student satisfaction. Taken together, these studies support the current finding that technology-supported academic systems are meaningfully related to students' perceptions of their academic experience.

The finding for Student Academic Quality provides a second but conceptually distinct contribution. TSAIS had a positive regression coefficient of 0.481 and a statistically significant t value of 11.778, with $p < 0.001$. The R^2 value of 0.387 indicates that TSAIS statistically explains 38.7% of the variance in Student Academic Quality. This result supports the proposition that technology-supported academic infrastructure is associated not only with students' immediate satisfaction but also with broader dimensions of academic quality represented by the study's measurement instrument. However, the lower R^2 compared with Student Learning Satisfaction is theoretically meaningful because academic quality is a broader and more multidimensional construct than satisfaction and therefore cannot reasonably be attributed to a single technological factor.

This interpretation is consistent with the multidimensional understanding of quality in higher education. Schindler et al. (2015) demonstrated that quality in higher education has been conceptualized through multiple dimensions and perspectives, indicating that academic quality should not be reduced to one institutional service, process, or technological component. Accordingly, the 38.7% explanatory contribution found in the present study should not be interpreted as evidence that TSAIS alone determines Student Academic Quality. Rather, it demonstrates that technology-supported academic infrastructure constitutes one meaningful component within a broader educational system. This interpretation is also compatible with Hasanah et al. (2025), who evaluated the quality of academic information system services in higher education, emphasizing the continuing relevance of institutional digital service quality within broader educational quality considerations.

The remaining 61.3% of variance in Student Academic Quality indicates that other factors may contribute to this outcome. Such factors may include pedagogical practices, lecturer competence, student motivation, learning engagement, institutional support, learning resources, academic culture, and other characteristics of the educational environment. These variables were not examined in the present regression model and therefore should not be interpreted as empirically established predictors in this study. Nevertheless, the difference between the two R^2 values suggests that digital academic infrastructure may have a more direct relationship with students' immediate perceptions of their learning experiences than with the broader quality of their academic development.

The distinction between satisfaction and academic quality can also be understood from the historical development of Academic Information Systems as institutional service technologies. Aulianto (2012) demonstrated that the implementation of an academic information system could contribute to the quality of student academic services, indicating that institutional information technologies have long been associated with service improvement. Nurwulandari (2020) similarly examined Academic Information System quality and service quality in relation to student satisfaction. These findings suggest that the most immediate contribution of academic information systems may occur through improved access to academic services and information. The present findings extend this argument by indicating that such systems may also be associated with broader academic quality, although their explanatory contribution to this outcome is comparatively smaller.

The difference between the two regression models therefore provides an important theoretical insight. TSAIS explains 59.0% of Student Learning Satisfaction but 38.7% of Student Academic Quality. This pattern suggests that digital academic systems may affect students most directly through accessibility, reliability, responsiveness, usability, and information availability. Academic quality, by

contrast, emerges from interactions among technological, pedagogical, human, and institutional factors. Educational technology should therefore be understood as complementary rather than deterministic. Technology can establish supportive conditions for academic processes, but the educational outcomes associated with those processes continue to depend on how technology interacts with pedagogy, lecturers, students, institutional resources, and academic practices.

This interpretation is also supported by research emphasizing system quality and information system success. Melgis et al. (2023) examined the quality of academic information systems in relation to system success, reinforcing the importance of evaluating digital academic infrastructure through dimensions that extend beyond technical implementation alone. Buditjahjanto (2023), using a fuzzy service quality approach, likewise demonstrated the relevance of service-quality dimensions in evaluating higher education Academic Information System services. These perspectives indicate that the value of TSAIS is created not simply through the existence of digital technology but through the extent to which the system is reliable, usable, responsive, informative, and aligned with students' academic requirements.

From a practical perspective, higher education institutions should therefore treat TSAIS as part of their educational technology infrastructure rather than as an isolated administrative application. Academic information systems should support students' access to academic schedules, registration services, grades, academic records, and other learning-related information in ways that promote continuity and reduce unnecessary barriers. The findings imply that improvements in system reliability, ease of use, information accuracy, accessibility, responsiveness, and service consistency are likely to be particularly relevant to students' satisfaction with their technology-mediated academic experiences (Anggraini et al., 2020; Azzahra & Hadiono, 2022; Marzuki & Sani, 2024).

At the same time, institutional investment in technology should be accompanied by pedagogical and human support. A technically reliable information system cannot by itself guarantee high academic quality when students experience weak instructional practices, inadequate academic guidance, limited learning resources, or insufficient institutional support. The lower explanatory contribution of TSAIS to Student Academic Quality compared with Student Learning Satisfaction reinforces this point. Technology can facilitate academic processes and provide students with better access to information, but its educational contribution ultimately depends on how effectively it is integrated into the broader institutional and learning environment.

Theoretically, the principal contribution of this study lies in broadening the interpretation of Academic Information Systems from administrative technology toward technology-supported academic and learning infrastructure. The significant relationships with both Student Learning Satisfaction and Student Academic Quality provide empirical support for considering institutional academic technologies as part of the educational environment experienced by students. The findings do not imply that TSAIS replaces teaching, learning, or pedagogical interaction. Rather, TSAIS provides technological conditions that can facilitate access, interaction, continuity, organization, and information management within students' academic experiences. Consequently, Educational Technology research should consider not only dedicated instructional technologies but also institutional digital infrastructures that directly influence how students interact with and experience higher education.

Nevertheless, the findings should be interpreted within the methodological boundaries of the study. The cross-sectional correlational design identifies statistically significant relationships but does not establish definitive causal effects. Therefore, statements that TSAIS "improves" or "causes" Student Learning Satisfaction or Student Academic Quality should be interpreted cautiously. Future studies could employ longitudinal, comparative, experimental, or mixed-method designs to investigate how changes in technology-supported academic infrastructure relate to students' experiences over time (Dillman et al., 2020). Future models could also incorporate pedagogical quality, digital competence, student engagement, self-regulated learning, lecturer competence, institutional support, and measurable learning outcomes in order to develop a more comprehensive explanation of the role of institutional technology in higher education.

CONCLUSION

This study demonstrates that Technology-Supported Academic Information Systems positively and significantly association both Student Learning Satisfaction and Student Academic Quality in higher education. The findings indicate that technology-supported academic systems function not only as digital administrative platforms but also as educational technology infrastructures that facilitate students' learning experiences, academic engagement, and academic development. The stronger explanatory power observed for Student Learning Satisfaction suggests that students' perceptions of technology-supported academic services are closely associated with the quality of their learning experiences, while the significant association on Student Academic Quality highlights the broader educational value of integrating digital technologies into institutional academic environments.

Theoretically, this study extends previous research by repositioning Academic Information Systems within the perspective of educational technology, emphasizing their role as integral components of technology-supported learning ecosystems rather than merely information management systems. Practically, the findings suggest that higher education institutions should continuously improve the accessibility, reliability, responsiveness, and integration of Technology-Supported Academic Information Systems to strengthen both students' learning satisfaction and academic quality while supporting institutional digital transformation.

This study is limited to a single higher education institution and examines only the direct association of Technology-Supported Academic Information Systems on Student Learning Satisfaction and Student Academic Quality. Future research is encouraged to investigate more comprehensive educational technology models by incorporating additional variables such as digital literacy, learning engagement, self-regulated learning, technology acceptance, instructional quality, and institutional digital readiness across diverse higher education contexts.

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