

# THE IMPACT OF ONLINE LEARNING SERVICE QUALITY ON STUDENT SATISFACTION IN HIGHER EDUCATION

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## ABSTRACT

*This study aims to investigate the impact of online learning service quality on university student satisfaction. The regression model was chosen to measure the effect of online learning service quality on student satisfaction. The research sample consisted of 373 students in the Central Java region of Indonesia. Based on the results of the regression analysis, this study shows that the effect of the quality of online learning services on student academic and nonacademic satisfaction is in the high category (Academic Satisfaction  $R = 0.921$  and Nonacademic Satisfaction  $R = 0.801$ ). As a result, the quality of learning services significantly impacts student satisfaction. The findings of this study can be used as a reference for university leaders to establish policies related to improving the quality of learning, teaching, and elearning to increase student satisfaction.*

**Keywords:** *online learning, quality of learning, lecturer competency, quality of elearning, student satisfaction*

## INTRODUCTION

The COVID-19 pandemic has impacted various countries around the world, including Indonesia. Based on data as of July 18, 2021, Indonesia recorded the highest number of positive cases and deaths due to COVID-19 in the world (Sinuhaji, 2021). This condition prompted the adoption of a Community Activities Restrictions Enforcement policy in almost all parts of Indonesia. The state of COVID-19 pandemic has impacted various sectors, such as the economy, society, and especially the education sector. Students feel the effect on the education sector that is related to the implementation of learning activities. Learning, which before the pandemic used to be a face-to-face or offline system, was changed to an online system. The transition from face-to-face to online learning is believed to have reduced student satisfaction by 0.2% (Guest et al., 2018). Therefore, it is necessary to evaluate or study periodically (continuously)

what the perceptions of teachers and students are in order to support appropriate policies related to current learning (Gómez-Rey et al., 2016).

Recent facts show that online-based learning with the support of elearning has become the new trend of learning in higher education since the pandemic occurred and continues till this day (Larasati, 2023). Applications such as Zoom, Google Meet and others are still an essential medium for learning sessions and seminars in tertiary institutions (Makruf et al., 2022). Moreover, the pandemic has changed the mindset and learning model from offline to online and even hybrid. In several studies conducted postpandemic, students prefer hybrid learning due to its practicality, convenience, and flexibility (Kurnianingrum, 2023).

### *Research Problem*

In the context of higher education, the pandemic has had an impact on increasing student dropout rates in Indonesia (Aisyah, 2021). In addition to

economic factors, student satisfaction with services is also thought to encourage this condition. If analyzed with a quality management approach, customer satisfaction (students) is an essential factor. In the view of most experts, the quality of service can be measured by how satisfied customers are with the service. Satisfaction will ultimately have an impact on customer commitment and loyalty. The student's commitment to remain in college (continuance commitment) will encourage them not to quit or drop out of college.

In a pandemic, existing universities compete to develop a Learning Management System (LMS) with various technology platforms, such as Moodle and others. Using an LMS improves the quality of learning in higher education (Godlewska et al., 2019). Online learning can provide new learning experiences with digital media and various benefits for students and universities (Gorghiu et al. 2021). The quality of learning will ultimately impact students' passion to stay and continue to learn (Ruiz-Alfonso & León, 2019). The quality of learning will offer a student experience that must be supported by the network and applications available (Malinovski et al., 2018). In addition, to understand student expectations regarding an LMS, when developing or designing one it is necessary to conduct a survey of users, in this case, students (Santelli et al., 2020).

#### *Research Aim and Research Questions*

The change in the learning system from face-to-face to online requires the ability of lecturers as learning creators to adapt to online learning. Therefore, universities support this condition by providing elearning training and other learning support applications to lecturers to ensure the quality of education. Utilizing elearning in universities to support government policies can increase student satisfaction (Al-Samarraie et al., 2018). All of these efforts aim to keep quality or effective learning services, which ultimately impact student satisfaction (Tadesse et al., 2021). Therefore, student satisfaction must continue to be researched because it is crucial to encourage student motivation and aspirations in higher education online programs (Leong Lim et al., 2020) and is a measure of the success of online learning (Hamutoglu et al., 2018). In line with that, the variable of student satisfaction, based on research studies in the field of quality management, is determined or influenced

by how well stakeholders implement the quality of service. Thus, the quality of learning services during the pandemic needs to be measured to see how it impacts student satisfaction. This study attempts to answer the following research questions:

- What is the description of the quality of online learning services (learning, teaching, and elearning quality) and student satisfaction in tertiary institutions?
- How does the quality of online learning services affect student satisfaction (academic and nonacademic)?

#### **LITERATURE REVIEW**

##### *Quality of Learning Services*

Learning services during the COVID-19 pandemic were undoubtedly different from normal conditions. Currently, using technology to design a learning environment is the best option (Casanova et al., 2020). Online learning and teaching is the best alternative to prevent the spread of the virus. Thus, quality teaching is student-centered and supported by information and communication technology (Tadesse et al., 2018). This online learning model, in essence, is not new, as MOOCs (massive open online courses) have been running for a while and are trusted by their instructors as quality learning. The quality of learning in MOOCs can be achieved through social constructivism and independent learning approaches (Askeroth & Richardson, 2019).

Any model, media, or strategy used in learning aims to provide students with quality learning services. The quality of learning, according to Biggs and Tang (2011), is a support structure in developing students' self-confidence in making decisions for their learning (Choy et al., 2019). In line with that, students get a quality teaching and learning experience when supported by the approach used, the expected results, the learning environment, the lecturer's role, and the students' involvement in the learning process (Tadesse et al., 2018). In line with that, quality learning in higher education is the central encouragement and goal for educators and researchers (Phan, 2014).

Quality of learning, according to Choy et al., (2019), can be seen from five main factors: (a) delivery and support, (b) learning skills, (c) resources, (d) learning environment, and (e) curriculum.

Meanwhile, quality learning that can encourage deep and meaningful understanding for students is supported by at least three main elements: (a) assessment strategy, (b) classroom environment, and (c) alignment of learning objectives (Phan, 2014).

The quality of learning in terms of teaching quality is determined by professional educational abilities, scientific field abilities, and educational spirit and attitude (Ko & Chung, 2014). In line with that, the quality of learning is the ability of a professional educator and scientist to convey knowledge or give lessons to students (Muhsin et al., 2020). So, the quality of learning is determined by educational background, lecturer decisions, classroom atmosphere, and the quality of the learning process and its context (Muhsin et al., 2020). More specifically, Stracke (2019) argued that the quality of learning in the extended discussion of learning experts is determined by:

- **Learning objectives:** The vision and goals must be precisely defined to take full advantage of the potential of future knowledge, education, and training, and for students to develop these to the best of their abilities.
- **Implementation of learning:** The whole process of learning, education, and learning related to quality development must be realized, including learning design, learning implementation, assessment, and evaluation of learning, and other learning opportunities.
- **Learning achievement:** This is the result of realized learning opportunities, such as what students have learned. These achievements are not the result of a production process or service but are built and achieved by the students themselves.

The pandemic has shifted the paradigm of face-to-face learning to online learning, where the quality of online learning is determined by how well the virtual environment and pedagogy can promote or encourage the quality of learning. This is a form of active, constructive, collaborative, intentional, contextual, transfer, and reflective learning (Mavengere & Ruohonen, 2018). Dimensions that can be measured in describing the quality of online or virtual learning include virtual learning experiences of students, learning content, and learning technology (Mavengere & Ruohonen, 2018). More

specifically, Elumalai et al. (2020) argued that the quality of learning of elearning is determined by the following considerations:

- Elearning increases student achievement levels and makes it fun.
- Elearning improves the presentation of content and instructor activities.
- Elearning increases the bond between instructors and students.
- Elearning is more user-friendly and convenient for instructors and students.
- Elearning allows instructors to record lectures and listen to students.
- Elearning provides two-way communication and collaboration among students.

Based on the literature review above, the quality of online learning services during the pandemic in this study was measured using three dimensions:

- **Quality of the learning process:** This includes the achievement of goals, individual and group guidance, independent study abilities, support for learning resources, learning climate, and online learning design.
- **Lecturer competence:** This is the ability to teach online, the suitability of the field with the lecturer's expertise, the motivation of the lecturer in online learning, and the attitude shown by the lecturer in online education.
- **Quality of eLearning:** This includes several elements, such as using elearning is fun, the material is easy to understand, the instructions are easy and comfortable to use, the learning process is well recorded in the elearning database, and there is two-way communication.

### *Student Satisfaction with Learning Services*

Universities' efforts to improve the quality of their services are evidence of their seriousness in ensuring the quality of their graduates. The quality of higher education services is determined by factors such as the quality of administration, the physical environment, core education, supporting facilities, and transformation (Kardoyo et al., 2020). Of these factors, education and teaching are directly perceived and related to student achievement and satisfaction. So, student satisfaction with the learning services they achieve is also

essential in determining the quality and future of higher education.

The COVID-19 pandemic has changed the learning system from face-to-face to online or virtual learning. Student satisfaction in online or virtual learning can be measured using three main scales: contribution, pleasure, and communication (Hamutoglu et al., 2018). This research focuses on the student satisfaction variable, which measures how satisfied students are with the learning they experienced during and after the COVID-19 pandemic.

Conceptually, satisfaction is a person's happiness or disappointment when comparing the perceived performance of a product or service with their expectations (Kotler & Keller, 2008). If the implementation does not meet their expectations, the customer is dissatisfied and disappointed, and vice versa (Muhsin et al., 2020). Therefore, user (i.e., student) satisfaction can be used to measure the gap between expectations and reality for the quality of the existing system (Muhsin et al., 2020). The experience of higher education students, especially with learning services, must be measured for their perceptions of how satisfied they are with the quality of existing services (especially related to learning) because they are direct customers of an educational institution.

According to Smith et al. (2007), in general, customer perceptions of service quality can be measured and evaluated through five service quality dimensions: (a) Tangibles, which include physical facilities, employee performance, equipment used, and physical presentation; (b) Reliability, the ability to provide the promised service reliably and appropriately; (c) Responsiveness, the willingness or readiness of employees to provide services and help customers; (d) Assurance, the knowledge, courtesy, and ability of employees to gain customer trust; and (e) Empathy, the care and attention of the organization to individual customers (Kardoyo et al., 2020).

Student satisfaction with service quality can be divided into academic and nonacademic satisfaction (Kardoyo et al., 2020). In line with that, student satisfaction with online learning can be measured through learning facilities, involvement in learning, and online assessment (Leong Lim et al., 2020). Learning satisfaction can be seen from satisfaction with learning management,

the learning process, and the learning evaluation (Ferris, 2018; Ko & Chung, 2014; Stracke, 2019).

Based on the literature review above, the Student Satisfaction variable in this study was measured by two dimensions: Academic Satisfaction and Nonacademic Satisfaction. Indicators of academic and nonacademic satisfaction are as follows:

1. **Academic Satisfaction:** (a) satisfaction with the lesson plan, (b) satisfaction with the delivery of materials, (c) satisfaction with easy access to learning resources, (d) satisfaction with interaction with lecturers in learning, (e) satisfaction with interaction with other students, (f) satisfaction with the form of evaluation used, and (g) satisfaction with feedback from lecturers.
2. **Nonacademic Satisfaction:** (a) satisfaction with elearning design and (b) satisfaction with virtual face-to-face lectures.

## RESEARCH HYPOTHESES

The quality of service provided by the teacher affects student satisfaction (Tsevi, 2020). Specifically, the teaching quality of lecturers has a positive effect on student learning satisfaction. With quality learning provided by lecturers, students will get a good learning experience (Ko & Chung, 2014). In other studies, student satisfaction is influenced by the quality of teaching by lecturers but also by learning facilities. The quality of teaching by lecturers and learning facilities is determined by good college governance (Muhsin et al., 2020). That is, university or college support determines student satisfaction with their learning (Nugraha et al., 2020). Specifically, elearning-based learning impacts and increases student outcomes and satisfaction (Elumalai et al., 2020). This research is supported by research findings that independent learning, or SLR (Self-Regulated Learning), affects online learning satisfaction (Leong Lim et al., 2020).

The research conducted by Kardoyo et al. (2020) tested the hypothesis of the influence of university services (academic and nonacademic) on student satisfaction at the State University of Semarang (UNNES) and concluded that the quality of academic services had no positive and significant effect on student satisfaction. On the other hand, the quality of nonacademic services



Table 1.  
Research Instrument Development

Variable	Dimensions	Indicators	Corrected Item-Total Correlation	Validity
Online Learning Service Quality (OLSQ)	Quality of Learning Design and Implementation (Quality of Learning Process)	1. Achievement of learning objectives	.839	Valid
		2. Individual and group tutoring	.852	Valid
		3. Self-study ability	.821	Valid
		4. Learning resources (supporting references)	.767	Valid
		5. Learning climate (academic climate)	.808	Valid
		6. The design of learning according to the demands of the times (current conditions) or online learning design	.730	Valid
	Quality of Teaching Professional (Lecturer Competency)	7. Lecturers' ability to educate or teach online	.824	Valid
		8. Conformity between the expertise of the lecturer and the field being taught	.825	Valid
		9. Lecturer motivation in online learning	.588	Valid
		10. The attitude of the lecturer in online learning	.650	Valid
	Quality of eLearning	11. Online learning with elearning is fun	.814	Valid
		12. The material is conveyed well (easy to understand) through elearning	.863	Valid
		13. Instructions (orders/assignments) in elearning are easy to understand	.930	Valid
		14. The convenience of using elearning	.750	Valid
		15. Learning is well recorded in the elearning database	.670	Valid
		16. Effective two-way communication is created in elearning	.785	Valid
Student Satisfaction	Academic Satisfaction and Nonacademic Satisfaction	17. Satisfaction with the learning plan	.731	Valid
		18. Satisfaction with the delivery of lecture materials	.888	Valid
		19. Satisfaction with easy access to learning resources	.713	Valid
		20. Satisfaction with interaction with lecturers in learning	.810	Valid
		21. Satisfaction with interaction with other students	.675	Valid
		22. Satisfaction with the evaluation form	.883	Valid
		23. Satisfaction with the feedback given by the lecturer	.846	Valid
		24. Satisfaction with elearning design	.689	Valid
		25. Satisfaction with virtual face-to-face lectures	.829	Valid

has a positive and significant impact on student satisfaction, meaning that learning support facilities are a factor determining student satisfaction.

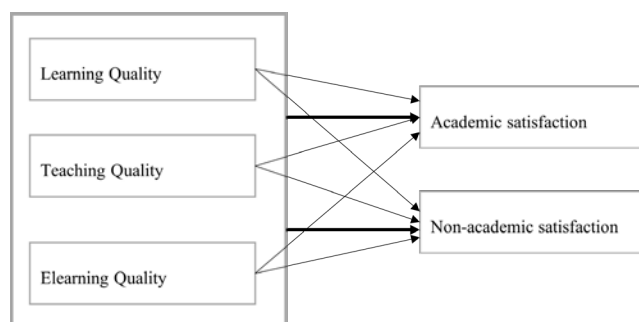
Based on several previous research studies above, the hypotheses of this research address

the effect of learning services quality (quality of learning design and implementation, quality of professional teaching, and quality of elearning) on student satisfaction (academic and nonacademic satisfaction), as can be seen in Figure 1.

The research hypotheses are as follows:

- $r_1$  = effect of learning quality on student academic satisfaction.
- $r_2$  = effect of teaching quality on student academic satisfaction.
- $r_3$  = effect of elearning quality on student academic satisfaction.
- $r_4$  = effect of learning quality on student nonacademic satisfaction.
- $r_5$  = effect of teaching quality on student nonacademic satisfaction.
- $r_6$  = effect of elearning quality on student nonacademic satisfaction.

Figure 1.  
Research Model



$R_1$  = effect of learning services quality (quality of learning design and implementation, quality of professional teaching, and quality of elearning) on academic student satisfaction.

$R_2$  = effect of learning services quality (quality of learning design and implementation, quality of professional teaching, and quality of elearning) on nonacademic student satisfaction.

## METHODOLOGY

### General Background

We used a quantitative approach with a correlational (regression) design for this study. The research data were taken from active students in online lectures during the COVID-19 pandemic in Indonesia.

### Sample

The number of samples using the sampling technique was based on the number of research indicators multiplied by 10, considering the ideal conditions for the selection in the ML (Maximum Likelihood) criteria, which is in the range of 200–400 samples (Byrne, 2010; Santoso, 2015). Based on this, this study's minimum number of samples was  $25 \times 10 = 250$  people. This study included 373 students from Raden Mas Said Surakarta State Islamic University.

### Instrument and Procedures

The instrument in this study was a questionnaire based on the literature review above. It is the result of the elaboration of various opinions with the aim of getting a comprehensive picture of the variables being measured. The scale we used in this

study was a Likert scale with five answer choices (scores 1–5). We tested the research instrument for validity and reliability on 30 samples ( $r$  table 0.361). The eligible instrument was based on the results of its validity test as shown in Table 1.

We tested the results of the reliability of the instrument using Cronbach's Alpha. Based on the result of Cronbach's Alpha analysis shown in Table 2, a result of  $0.976 > 0.60$ , which meets the element of reliability or consistency.

Table 2.  
Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.976	.977	25

### Data Analysis

This study used a regression Formula to test (measure) the effect of the independent variable (Quality of Learning Services) on the dependent variable (Student Satisfaction). In practice, we used SPSS for data analysis.

## RESULTS

### Description of Online Learning Service Quality and Student Satisfaction

This study measured two variables: Quality of Online Learning Services and Student Satisfaction.

Table 3.  
Descriptive Statistic

Variable	Dimension	Theoretical		Empirical				
		Range	Mean	Range	Mean	Median	Mode	SD
Quality of Learning Services	Learning Quality (Quality of Learning Process, Design, and Implementation)	24 (6–30)	12	16 (14–30)	22.87	23.00	24	3.658
	Teaching Quality (Lecturer Competency)	16 (4–20)	8	10 (10–20)	16.55	16.00	16	2.374
	Elearning Quality	24 (6–30)	12	17 (13–30)	22.56	23.00	24	4.006
Student Satisfaction	Academic Satisfaction	28 (7–35)	14	19 (16–35)	27.31	28.00	28	4.257
	Nonacademic Satisfaction	8 (2–10)	4	6 (4–10)	7.76	8.00	8	1.412

Quality of Online Learning Services was calculated based on three dimensions: Learning Quality, Teaching Quality, and Elearning Quality. Meanwhile, Student Satisfaction was measured using two dimensions: Academic Satisfaction and Nonacademic Satisfaction. Student responses based on these variables can be seen in Table 3.

Table 3 shows that the Learning Quality score ranges are 16 (from 14 to 30). Compared to the theoretical range of 24 (distributed from 6 to 30), the data distribution is smaller than the theoretical. The average value of Learning Quality (empirical) is  $22.87 > 12.00$  (theoretical average), and the standard deviation is 3.658, which means that the quality of learning has a high tendency. Meanwhile, the score for the Lecturers Competency dimension has an empirical score of 10 (from 10 to 20), compared to the theoretical range of 16 (from 4 to 20), showing that the data distribution is smaller than the theoretical one. The average value of the dimensions of Lecturer Competency (empirical) is  $16.55 > 8.00$  (theoretical average), and the standard deviation is 2.374, which means that the competence of the lecturers has a high tendency. The score from the Elearning Quality dimension has an empirical score range of 17 (from 13 to 30). Compared to the theoretical range of 24 (from 6 to 30), the data distribution is smaller than the theoretical. The average value of the Lecturer Competency dimension (empiric) is  $22.56 > 12$ , and the standard deviation is 4.006, so the quality of elearning has a high tendency.

For the variable of Student Satisfaction, both Academic and Nonacademic, based on the data in Table 3, the Academic Satisfaction scores have a range of 19 (from 16 to 35) which, when compared to the theoretical range of 28 (from 7 to 35) the data distribution is smaller than the theoretical. The average value of Academic Satisfaction (empirical) is  $28.00 > 14.00$  (theoretical average), with a standard deviation of 4.257. Thus, we conclude that students' academic satisfaction has a high tendency. The Nonacademic Satisfaction score range is 6 (from 4 to 10), compared to the theoretical range of 8 (from 2 to 10), which is smaller than the theoretical. The average value of Nonacademic Satisfaction (empirical) is  $7.76 > 4.00$  (theoretical average), with a standard deviation of 1.412. We concluded that students' nonacademic satisfaction has a high tendency.

### *Effect of Online Learning Service Quality on Student Satisfaction*

Based on the proposed research hypothesis, this study examined the effect of learning service quality (Learning Quality, Teaching Quality, and Elearning Quality) on Student Satisfaction (Academic Satisfaction and Nonacademic Satisfaction). To prove this hypothesis, we used SPSS software in this study.

#### *Correlation between the quality of online learning services and student satisfaction.*

Based on the analysis of the data from the respondents' answers, the correlation between the learning, teaching, and elearning quality and student satisfaction (both academic and nonacademic) can be seen in the following table:

Based on the results of the correlation analysis in Table 4 we concluded that: (a) there is a significant correlation between Learning Quality and Academic Satisfaction with  $r_1$  of 0.866 (significant 0.01), (b) there is a significant correlation between Teaching Quality and Academic Satisfaction with  $r_2$  of 0.846 (significant 0.01), and (c) there is a significant correlation between Elearning Quality and Academic Satisfaction with  $r_3$  of 0.874 (significant 0.01). This means that, based on the correlation of all variables, the quality of online learning services has a significant correlation, and the highest is the quality of elearning.

The correlation between the variables Quality Of Learning Services and Nonacademic Satisfaction was found to be as follows: (a) there is a significant correlation between Learning Quality and Nonacademic Satisfaction with  $r_4$  of 0.745 (significant 0.01), (b) there is a significant correlation between Teaching Quality and Nonacademic Satisfaction with  $r_5$  of 0.747 (significant 0.01), and (c) there is a significant correlation between Elearning Quality and Nonacademic Satisfaction with  $r_6$  of 0.755 (significant 0.01). This means that based on the correlation of all variables, the quality of online learning services has a significant correlation with student nonacademic satisfaction, and the quality of elearning is the highest.

Variables of the quality of online learning services correlate with academic and nonacademic student satisfaction. The variable Elearning Quality has the highest correlation with both Academic Satisfaction and Nonacademic Satisfaction.

Table 4.  
Correlations

		Learning Quality	Teaching Quality	Elearning Quality	Academic Satisfaction	Nonacademic Satisfaction
Learning Quality	Pearson Correlation	1	.787**	.868**	.866**	.745**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	373	373	373	373	373
Teaching Quality	Pearson Correlation	.787**	1	.789**	.846**	.747**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	373	373	373	373	373
Elearning Quality	Pearson Correlation	.868**	.789**	1	.874**	.755**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	373	373	373	373	373
Academic Satisfaction	Pearson Correlation	.866**	.846**	.874**	1	.806**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	373	373	373	373	373
Nonacademic Satisfaction	Pearson Correlation	.745**	.747**	.755**	.806**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	373	373	373	373	373

\*\* . Correlation is significant at the 0.01 level (2-tailed).

*Effect of the quality of online learning services on student satisfaction.*

Based on the regression analysis test, the level of influence of the quality of online learning services on student satisfaction is as follows for Academic Satisfaction and Nonacademic Satisfaction:

- a. The effect of the Quality of Online Learning Services on student Academic Satisfaction (AS).

Based on Tables 5 and 6, we concluded that learning quality, teaching quality, and elearning quality significantly affect student academic satisfaction, both partially and together with a sig. 0.000. Meanwhile, based on the multiple regression coefficients, the value in column R in Table 5 is equal to 0.921. This means that variations in the overall quality of online learning services can affect changes in student academic satisfaction by

Table 5.  
Model Summary for Dependent Variable: Academic Satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.921a	.848	.847	1.658	.848	685.945	3	369	.000	2.022

a. Predictors: (Constant), Elearning Quality, Teaching Quality, Learning Quality

Table 6.  
ANOVA for Dependent Variable: Academic Satisfaction

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5656.432	3	1885.477	685.945	.000 <sup>a</sup>
	Residual	1014.281	369	2.749		
	Total	6670.713	372			

a. Predictors: (Constant), Elearning Quality, Teaching Quality, Learning Quality



92.1%, while other variables outside the research influence the remaining 7.9%. This means that the quality of online learning services in this study is a variable that significantly determines student academic satisfaction. The regression formula based on the coefficients in Table 7 is as follows:

$$\text{Academic Satisfaction (AS)} = 1.186 + 0.343\text{LQ} + 0.595\text{TQ} + 0.372\text{ELQ}$$

The equation implies that for every one increase in the value of the learning quality (LQ), teaching quality (TQ), and elearning quality (ELQ), the value of academic satisfaction (AS) will increase by 1.31.

Table 7.  
Coefficients for Dependent Variable: Academic Satisfaction

Model	B	Unstandardized Coefficients		Standardized Coefficients	t	Sig. Zero-order	Correlations			Collinearity Statistics	
		Std. Error	Beta				Partial	Part	Tolerance	VIF	
1	(Constant)	1.186	.615		1.927	.055					
	Learning Quality (LQ)	.343	.050	.298	6.866	.000	.866	.337	.139	.219	4.559
	Teaching Quality (TQ)	.595	.062	.334	9.538	.000	.846	.445	.194	.336	2.980
	Elearning Quality (ELQ)	.372	.046	.352	8.083	.000	.874	.388	.164	.217	4.600

Table 8.  
Model Summary for Dependent Variable: Nonacademic Satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.801 <sup>a</sup>	.642	.639	.844	.642	220.166	3	369	.000	1.739

<sup>a</sup> Predictors: (Constant), Elearning Quality, Teaching Quality, Learning Quality

Table 9.  
ANOVA for Dependent Variable: Nonacademic Satisfaction

Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	470.691	3	156.897	220.166	.000 <sup>a</sup>
	Residual	262.960	369	.713		
	Total	733.651	372			

<sup>a</sup> Predictors: (Constant), Elearning Quality, Teaching Quality, Learning Quality

Table 10.  
Coefficients for Dependent Variable: Nonacademic Satisfaction

Model	B	Unstandardized Coefficients		Standardized Coefficients	t	Sig. Zero-order	Correlations			Collinearity Statistics	
		Std. Error	Beta				Partial	Part	Tolerance	VIF	
1	(Constant)	.161	.313		.514	.608					
	Learning Quality (LQ)	.084	.025	.220	3.313	.001	.745	.170	.103	.219	4.559
	Teaching Quality (TQ)	.201	.032	.340	6.322	.000	.747	.313	.197	.336	2.980
	Elearning Quality (ELQ)	.104	.023	.296	4.424	.000	.755	.224	.138	.217	4.600

- b. The effect of the quality of online learning services on nonacademic student satisfaction.

Based on Tables 8 and 9, we concluded that learning quality, teaching quality, and elearning quality significantly affect student nonacademic satisfaction, both partially and together with sig. 0.000. Meanwhile, based on the multiple regression coefficient, the value in column R in Table 7 is equal to 0.801. This means that variations in the overall quality of online learning services can affect changes in student nonacademic satisfaction by 80.1%, while the remaining 19.9% is influenced by other variables outside of this study. This means that the quality of online learning services in this study is a variable that significantly determines student nonacademic satisfaction. The regression formula based on the coefficients in Table 10 is as follows:

$$\text{Nonacademic Satisfaction (NS)} = 0.161 + 0.084\text{LQ} + 0.201\text{TQ} + 0.104\text{ELQ}$$

The equation implies that for every one increase in the value of the learning quality (LQ), teaching quality (TQ), and elearning quality (ELQ), the value of nonacademic satisfaction (NS) will increase by 0.389.

## DISCUSSION

Based on the research findings, we concluded that there is a significant influence on the quality of online learning services, in the quality of learning design and implementation (learning quality), teaching quality, and elearning quality, on both academic and nonacademic student satisfaction (Mikhael et al., 2022). The findings regarding the effect of the design and implementation of learning and professional pursuits on student satisfaction are in line with what was found by Ammigan et al., (2021), who said that the learning experience (which is the impact of learning design and implementation as well as professional pursuits) influences student satisfaction. The continuity of quality services received by students will have an impact on their satisfaction (Chaudhary & Dey, 2021). In line with that, this study indirectly rejects the finding that the professional development of lecturers does not affect (is not a significant factor) student satisfaction in online learning (Kane et al., 2016).

The research finding that the use of elearning affects student satisfaction is in line with research

(Alkhateeb & Abdalla, 2021), proving that the Learning Management System quality determines student satisfaction with learning services. Furthermore, this study also supports research findings that say quality factors (quality of course content, system quality, and service quality) have a positive and significant effect on student satisfaction with the quality of the elearning system (Al Mulhem, 2020; Leong Lim et al., 2020). Further research shows that teachers and students see elearning as an effective tool to improve instruction delivery and develop knowledge acquisition skills through the transfer of learning (Elcullada Encarnacion et al., 2021). This means that elearning learning can be effective and increase student satisfaction.

Based on the discussion above, we concluded that the quality of learning services affects student satisfaction. We also concluded that there is a significant effect of the quality of learning services on academic and nonacademic satisfaction in this study, in line with or supporting the evidence also supplied by Kardoyo et al., (2020), who said that service quality affected student academic and non-academic satisfaction.

The importance of the student satisfaction variable is due to its impact on: (a) learning outcomes (Ching & Maarof, 2021), (b) student engagement and motivation (Karaođlan Yılmaz, 2022), (c) students' intention to continue using the online learning system (Daneji et al., 2019), (d) word-of-mouth promotion (Kanduri & Radha, 2023; Mikhael et al., 2022), and (e) student loyalty (Chandra et al., 2018). Therefore, improving the quality of online learning services needs to be improved continuously to increase student satisfaction and engagement.

## CONCLUSION AND IMPLICATIONS

Based on the findings and discussion of the research results, it can be concluded that the quality of online learning services has a significant effect on student satisfaction (both academic and nonacademic). The online learning service quality is reflected in the learning quality (the quality of learning design and implementation), the teaching quality, and the elearning quality. Meanwhile, student satisfaction is based on the academic and nonacademic dimensions. So, the quality of the dimensions of learning design and implementation,

professional teaching, and elearning play an important role in increasing student satisfaction.

The implication of the results of this study is that the quality of learning services is an important factor that can determine the level of student satisfaction. Meanwhile, student satisfaction will ultimately have an impact on learning outcomes, student empowerment, student motivation, online learning sustainability, promotions, and loyalty. For this reason, the development related to the three dimensions of learning quality needs serious attention from stakeholders of the higher education institutions.

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