

# Digital service quality and its influence on student satisfaction at a public university in Lima

## Calidad del servicio digital y su influencia en la satisfacción de los estudiantes de una universidad pública de Lima

Roberto Alfonso Franco Ulco<sup>1,a</sup> 

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## ABSTRACT

**Objective.** To determine the influence of digital service quality on student satisfaction with the digital platform of a public university located in the district of Cercado de Lima, Peru, in 2024. **Methods.** A quantitative, explanatory-level, non-experimental, cross-sectional design was used. The study population consisted of 36,600 students enrolled during 2024, and a probabilistic sampling method determined a sample of 381 participants. Data were collected through a survey technique using a questionnaire distributed via email. For inferential analysis, a multiple linear regression model was applied. **Results.** Findings showed that 61.2 % of students rated the quality of digital service as fair, while 51.2 % assessed their satisfaction level similarly. At the inferential level, the model yielded an  $R^2$  of 0.565 with a significance of 0.000, indicating that digital service quality influences satisfaction by 56.5 %, representing a moderate-to-high level of explanatory power. The significant factors of digital service quality impacting satisfaction were system quality (14.8 %), reliability (19.8 %), information quality (12.6 %), responsiveness (13.4 %), and especially interactivity (22.8 %), the most influential factor. **Conclusions.** Digital service quality influences student satisfaction at the national university in Lima in 2024.

**Keywords:** service quality; students; digital platform; satisfaction; national university.

## RESUMEN

**Objetivo.** Determinar la influencia de la calidad del servicio digital en la satisfacción de los estudiantes sobre la plataforma digital de una universidad pública ubicada en el distrito del Cercado de Lima, Perú, 2024. **Métodos.** Enfoque cuantitativo, de nivel explicativo, de diseño no experimental y de corte transversal. La población fue de 36 600 estudiantes matriculados durante el año 2024 y a través del muestreo probabilístico se determinó una muestra de 381 jóvenes. En la recolección de datos se utilizó la técnica de la encuesta y el instrumento aplicado fue el cuestionario, enviado por correo electrónico, mientras que para el análisis inferencial se empleó el modelo de regresión lineal múltiple. **Resultados.** Se evidenció que el 61,2 % de los estudiantes calificó la calidad del servicio como regular, mientras que el 51,2 % evaluó de la misma manera su nivel de satisfacción. A nivel inferencial, el modelo obtuvo un  $R^2$  de 0,565 con una significancia de 0,000, es decir, la calidad de servicio digital influye en un 56,5 % sobre la satisfacción, estableciéndose en un nivel moderado-alto al explicar gran parte de la influencia; además, los factores de la calidad de servicio digital significativos en su impacto sobre la satisfacción fueron: la calidad del sistema (14,8 %), confiabilidad (19,8 %), calidad de información (12,6 %), capacidad de respuesta (13,4 %) y, sobre todo, interactividad (22,8 %), siendo este último el factor más importante. **Conclusiones.** La calidad de servicio digital influye sobre la satisfacción en los estudiantes de la universidad nacional en Lima en el año 2024.

**Palabras clave:** calidad de servicio; estudiantes; plataforma digital; satisfacción; universidad nacional.

### Affiliation and academic degree

<sup>1</sup> Universidad Nacional Mayor de San Marcos, Lima, Perú.

<sup>a</sup> Bachelor of Economics.

## INTRODUCCION

The accelerated digitalization of higher education has exposed critical gaps and structural deficiencies in the quality of digital services provided to students, with a noticeable decline in engagement and performance when platforms fail to deliver effective virtual learning (Htang, 2021; Rasheed & Rashid, 2024; Sohail & Hasan, 2021). The digital divide is reflected in the inability to implement advanced solutions that enhance user experience (Nguyen et al., 2024). This issue is particularly critical in resource-limited countries, where inequalities are exacerbated and system slowness becomes evident (Dangaiso et al., 2022; Dugenio-Nadela et al., 2023). A paradox emerges: while digital tools promise greater accessibility, their poor implementation ultimately excludes segments of the student population (Ali et al., 2024).

Peru faces critical challenges regarding the quality of university digital services, which affect student satisfaction due to low platform reliability and inadequate technical support (Vergíu Canto, 2022). In private universities, the disconnect between administrative support and academic needs leads to student frustration (Acuña Benites et al., 2021). Inequalities further aggravate the issue, as a large proportion of students access virtual resources with limited browsing speed and non-adaptive design (Pérez-Sullcaray et al., 2023). The local context of a public university in the Cercado de Lima district reveals insufficient technological infrastructure, limiting access and perpetuating connectivity issues (network slowness, weak Wi-Fi signal, slow searches, and signal interference) as well as deficiencies in information quality.

At the South American level, Cruz Dallagnol and Portulhak (2025) identified governance as the most influential factor in satisfaction (60.5 %). In Bangladesh, Asia, Sumi and Kabir (2021) estimated that digital service quality accounts for a 31.7% impact on satisfaction, specifically due to website design (22.7 %), security (17.8 %), reliability (12.6 %), and responsiveness (9.6 %). In Iraq, Jameel et al. (2021) demonstrated that responsiveness, privacy, and security significantly influence student satisfaction. Similarly, in Nigeria, Borishade et al. (2021) reported a significant association between digital service quality and student satisfaction through its dimensions of reliability (85%) and responsiveness (84 %). In Vietnam, Doan (2021) found that digital service quality has a moderate impact (34.1 %) on university student satisfaction.

In Peru, Claros Vásquez (2024) determined a correlation between digital service quality and satisfaction among university students in Barranca, with a Spearman's rho of 0.668. Likewise, Huapaya et al. (2023) calculated a direct, moderate-intensity (Kendall's Tau of 0.527) and statistically significant correlation between service quality and student satisfaction. Álvarez Peña and La Rosa Botonero (2021) evidenced the relationship between the quality of a digital platform and student satisfaction, reporting a Spearman's rho of 0.416 between the variables. Similarly, Barrera Loja (2020) calculated a Spearman's rho of 0.475, indicating a direct and positive relationship between service quality and student satisfaction. Jiménez Chinga and Zeta Vite (2020) highlighted that service quality exerts a 45.2 % influence on university student satisfaction. It is worth noting that satisfaction refers to the subjective perception of well-being, reflecting the extent to which a service meets or exceeds user expectations (Torres Gómez, 2023); it may also be understood as an affective state of pleasure, well-being, or gratification experienced when a desire, need, or expectation has been fulfilled (Xiong et al., 2022).

This study was justified by the critical importance of digital service quality in contemporary higher education. The growing digitalization of universities requires understanding the factors influencing student satisfaction by identifying how the dimensions of service quality affect a university's digital platform, as well as its usability and reliability, in order to improve the virtual environment, optimize user experience, and ensure student satisfaction within an increasingly digitalized system.

Therefore, the primary objective was to determine the influence of digital service quality on student satisfaction with the digital platform of a public university in the cercado de Lima, Peru, 2024.

## METHODS

### Study type and area

The research employed a quantitative approach, at an explanatory level, with a non-experimental and cross-sectional design, in accordance with Hernández Sampieri and Mendoza Torres (2018). The study was conducted at a public university located in the district of Cercado de Lima (Peru). The study period took place during 2024.

### Population and sample

The population consisted of 36,600 students enrolled during the year 2024, and a probabilistic simple

random sampling method was applied. A sample of 382 students was obtained using the finite population formula. The following inclusion criteria were considered: students over 18 years of age and with active enrollment at the university during the 2024-I or 2024-II academic periods. The exclusion criteria were: being under 18 years of age and not having active enrollment during the 2024-I or 2024-II periods. The sampling method applied was probabilistic.

### Variables and data collection instruments

Digital service quality is defined as the relationship between customers' expectations and the service provided, and it involves a systematic process of continuous improvement aimed at exceeding standards and increasing satisfaction (Aljukhadar et al., 2022; Parra Ferié et al., 2020). This process includes defining the concept, identifying dimensions, and analyzing results (Nookhao & Kiattisin, 2023). Digital management, as a strategic tool, enhances the student experience and ensures service quality by fostering transparency through access channels (Adubaa & Mayowa Adebara, 2022; Chan et al., 2025). Overall, this quality constitutes a key metric for evaluating the effectiveness of user–platform interaction and ensuring positive and consistent experiences (Ong et al., 2023; Yang & Li, 2021).

Satisfaction entails a subjective perception of well-being that reflects the extent to which a service meets or exceeds user expectations, functioning as an indicator of service performance (Alruwaie et al., 2020; Torres Gómez, 2023; Xiong et al., 2022). This perception increases when the platform is efficient, fast, and functional, influencing adoption decisions and continued use of the technology (Kim, 2023; Lee et al., 2022; Wang et al., 2024). It also promotes engagement, improves retention, strengthens linkage, enhances user satisfaction, and enables strategic adjustments that optimize the overall experience (Mata et al., 2023; Sharma et al., 2021).

The first variable corresponded to "digital service quality," measured using the questionnaire adapted from Li and Shang (2020), comprising 8 dimensions and 26 indicators distributed as follows: (1) system quality (4 indicators), (2) reliability (3 indicators), (3) security (3 indicators), (4) accessibility (3 indicators), (5) service capability (3 indicators), (6) information quality (4 indicators), (7) responsiveness (3 indicators), and (8) interactivity (3 indicators). These indicators were measured using a 5-point Likert scale, where 1 corresponded to "strongly disagree" and 5 to "strongly agree."

Regarding the scoring scale, the analysis range for the variable scores was 26–61 ("poor"), 62–95 ("fair"), and 96–130 ("good"). The synthesis for each dimension is presented in Annex 1. Reliability analysis yielded a Cronbach's alpha of 0.962, indicating high reliability.

The second variable was "satisfaction," composed of three indicators: service satisfaction, satisfaction with past experiences, and satisfaction of needs. Measurement was conducted using a questionnaire adapted from Li and Shang (2020), consisting of 3 Likert-scale questions rated from 1 to 5, where 1 corresponded to "strongly disagree" and 5 to "strongly agree." Reliability analysis yielded a Cronbach's alpha of 0.915, indicating high reliability. It should be noted that the overall 29-item instrument obtained a Cronbach's alpha of 0.968, demonstrating strong reliability. The high Cronbach's alpha value (> 0.9) indicates strong internal consistency among the questionnaire items.

Additionally, the instrument included an initial section to collect general student characteristics, such as age, sex, and field of study (basic sciences, health sciences, economics and management sciences, humanities and legal and social sciences, and engineering).

### Data collection techniques and procedures

The survey technique was used for data collection. The data collection period spanned from May to September 2024. Survey administrators verbally asked students whether they wished to participate; upon receiving a positive response, they were provided with a link or QR code to access the Google Forms questionnaire, allowing each student to complete it at their own pace. The online form also included a question asking whether they agreed to participate in the study, thereby obtaining informed consent.

The form included a section where students entered their university student code; this enabled verification that they met the inclusion criteria. Google Forms allowed real-time updating of responses and automatic data systematization into a general database table. Additionally, the questionnaire was distributed virtually via WhatsApp and university student groups, whose members voluntarily chose to participate. This approach broadened the study's reach across all faculties of the public university in the Cercado de Lima and supported the attainment of a representative sample.

### Data analysis

Initially, descriptive analysis was conducted by presenting the variables and their dimensions in tables and figures, using descriptive statistical tools to provide a detailed overview.

Inferential analysis was performed using a multiple linear regression model to identify patterns and determine statistically significant effects (Greene, 2019). Additionally, the ANOVA statistical test was applied, and a 95 % confidence level (Z) was used for hypothesis acceptance or rejection within the proposed model. Subsequently, the R<sup>2</sup> coefficient was employed to determine the regression model's precision and predictive capacity (Galindo Domínguez, 2020). To identify the influence relationship between the variables, a multiple linear regression model was used, as suggested by the following equation:

Multiple linear regression equation

$$SAT = b_1 SQY + b_2 REL + b_3 SCT + b_4 ACB + b_5 SEC + b_6 IQ + b_7 RSP + b_8 INT$$

Where:

SAT: satisfaction; *b*<sub>1</sub>: regression coefficient; SQY: system quality; REL: reliability; SCT: security; ACB: accessibility; SEC: service capability; IQ: information quality; RSP: responsiveness; INT: interactivity.

### Ethical considerations

This research was conducted in accordance with ethical principles and scientific rigor, respecting intellectual property and the guidelines governing academic production. Furthermore, the study was conducted externally and independently in order to prioritize participant autonomy. Data collection was conducted in a non-intrusive manner and without direct involvement of the institution's academic authorities; therefore, it was not necessary to request permission from the university or disclose its name in the study, thereby preserving privacy. This aspect was essential to ensure students' freedom and confidence in their responses.

Informed consent was obtained from participants through a screening question asking whether they wished to participate in the study. Additionally, all consulted sources were properly cited, ensuring explicit recognition of authorship in the development of the theoretical and methodological framework. The study was grounded in the fundamental principles of research ethics—honesty, integrity, transparency, and respect—and all findings were used strictly for academic purposes.

## RESULTS

The analysis of students' general characteristics revealed that, by field of study, economics and management sciences was the most represented discipline, comprising nearly one-third of the students (29.4%). The fields of humanities and legal and social sciences, as well as engineering, also showed considerable enrollment, accounting for 23.4% and 21.8% of students, respectively. Health sciences and, to a lesser extent, basic sciences had fewer enrolled students (see Table 1).

**Table 1**

*General characteristics of the students*

Characteristic	fi	%
<b>Sex</b>		
Male	219	57.5
Female	162	42.5
<b>Age range</b>		
16–24 years	266	69.8
25–34 years	65	17.1
35–45 years	31	8.1
46 years and older	19	5.0
<b>Field of study</b>		
Basic sciences	28	7.3
Health sciences	69	18.1
Economics and management sciences	112	29.4
Humanities and legal and social sciences	89	23.4
Engineering	83	21.8

The analysis of the results revealed the levels of digital service quality and student satisfaction. Table 2 presents the level of perception regarding digital service quality (e-SQ) and satisfaction (SAT). The highest percentage of responses was concentrated in the "fair" category, with 61.2 % for service quality and 51.2% for satisfaction, indicating a moderate perception and highlighting areas for improvement.

In the "good" category, the values were similar (28.9 % for e-SQ and 28.6 % for SAT), reflecting a smaller proportion of fully satisfied users. In contrast, only 9.97% perceived the quality as poor; however, 20.2 % reported a low level of satisfaction.

Table 3 presents the number of participants who rated their perception of digital service quality. System quality (SQY) reached 61.4% in the "fair" category, although a notable 35.7% considered it "good."

**Table 2**  
*Analysis of digital service quality and student satisfaction*

Variable	Poor		Fair		Good	
	fi	%	fi	%	fi	%
Digital service quality	38	9.97	233	61.15	110	28.87
Satisfaction	77	20.21	195	51.18	109	28.61

Reliability (REL), responsiveness (RSP), and interactivity (INT) showed significant percentages in the "poor" category (19.4%, 31.5%, and 28.3%, respectively).

In contrast, dimensions such as security (SCT) and information quality (IQ) displayed more balanced ratings between "good" and "fair," with proportions of 35.2 % and 47.5 %, respectively. Overall, these findings reflect a moderate perception of digital services, highlighting the need for strategic actions to improve their overall quality.

On the other hand, the inferential analysis presents the results addressing the stated objective and details the multiple linear regression model and its statistical significance. Table 4 indicates that the model used to determine satisfaction was statistically significant, with a significance value of  $0.000 < 0.05$ . Additionally, an  $R^2$  of 0.565 was obtained, indicating that 56.5% of the variability in satisfaction is explained by the dimensions of the digital service quality model. The adjusted  $R^2$  of 0.556 was close to the original  $R^2$  value.

Subsequently, multiple linear regression analysis was conducted to evaluate the influence and statistical

**Table 3**  
*Analysis of service quality dimensions*

Dimension	Poor		Fair		Good	
	fi	%	fi	%	fi	%
SQY	11	2.9	234	61.4	136	35.7
REL	74	19.4	215	56.4	92	24.1
SCT	66	17.3	181	47.5	134	35.2
ACB	58	15.2	194	50.9	129	33.9
SEC	65	17.1	205	53.8	111	29.1
IQ	52	13.6	210	55.1	119	31.2
RSP	120	31.5	176	46.2	85	22.3
INT	108	28.3	192	50.4	81	21.3

significance of each digital service quality dimension on user satisfaction with digital platforms. Standardized coefficients were employed, as these measure the comparative impact of independent variables and are useful for comparing the magnitude of effects across predictors (Gujarati, 2018).

Table 6 presents the standardized coefficients showing the influence of the significant dimensions. Five dimensions—system quality, reliability, information quality, responsiveness, and interactivity—obtained significance levels below 0.05.

Based on the standardized coefficients (beta), the multiple linear regression analysis can be summarized by the following function:

$$SAT = 0,148 SQY + 0,198 REL + 0,126 IQ + 0,134 RSP + 0,228 INT$$

The equation represents a linear regression model that estimates satisfaction (SAT) as a function of the

**Table 4**  
*Model summary and ANOVA of the regression model*

Model summary						
Model	R	R2	Adjusted R <sup>2</sup>	Std. Error		
RML_univ	0.752	0.565	0.556	0.463		
ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	103.658	8	12.957	60.513	0.000
RML_univ	Residual	79.654	372	0.214		
	Total	183.312	380			

**Table 5**  
*Analysis of significant model coefficients*

Model	Standardized Coefficients	
	Beta	Sig. (p-value)
SQY	0.148	0.001*
REL	0.198	0.000*
SCT	0.035	0.421
ACB	0.065	0.164
SEC	0.035	0.515
IQ	0.126	0.018*
RSP	0.134	0.005*
INT	0.228	0.000*

dimensions of digital service quality, where each coefficient indicates its relative weight in explaining satisfaction. Interactivity (INT) has the highest coefficient (0.228), suggesting that it is the factor with the greatest influence on satisfaction. It is followed by reliability (REL), with 0.198, and responsiveness (RSP), with 0.134, key elements in the perception of efficiency and support. System quality (SQY) and information quality (IQ) also contribute, although to a lesser extent, with 0.148 and 0.126, respectively. Thus, the model indicates that improvements in these dimensions could significantly increase student satisfaction.

## DISCUSSION

Based on the results obtained, the findings were compared with those of Sumi and Kabir (2021) in Bangladesh, where learning content ( $\beta = 0.317$ ) showed a greater impact than web design ( $\beta = 0.259$ ). A notable difference emerges from our results, which assign lower relative relevance to information quality (12.6 %). This suggests that in contexts with lower technological development, such as Bangladesh, pedagogical aspects may take precedence over technical components, which were more decisive in our study.

In the case of Jameel et al. (2021) in Iraq, who highlighted the importance of responsiveness and security in digital platforms, there is partial agreement with our findings, where responsiveness (13.4 %) appears as the third most important factor, behind interactivity and reliability. This variation in the ranking of priority factors may reflect cultural differences in service expectations between the two contexts, with interactivity being particularly valued in the Peruvian university setting analyzed.

Similarly, the findings of Borishade et al. (2021) in Nigeria, which reported high coefficients for reliability (0.85), show important convergence with our result of 19.8% for the same dimension, confirming that the stability and consistency of digital platforms are universally relevant factors. When compared with Doan (2021) in Vietnam, where a moderate effect ( $\beta = 0.341$ ) of service quality on student satisfaction was found, notably lower than our 56.5%, a significant difference is observed. This may be attributable to the greater development and maturity of Vietnam’s digital education system and the widespread use of technology in that country. This divergence underscores the importance of technological development level.

In Peru, the findings of Claros Vásquez (2024) in Barranca, who reported a moderate correlation ( $\rho = 0.668$ ) between service quality and satisfaction, confirm the positive relationship found in our study; however, they place greater emphasis on accessibility, whereas our results show the predominance of interactivity. This difference may reflect regional variations in digital expectations and needs within Peru.

For their part, Huapaya et al. (2023) found an association of similar magnitude ( $\tau = 0.527$ ), but with greater weight given to sociodemographic factors, which contrasts with our model focused on intrinsic service attributes. This divergence may be explained by the specific pandemic context in which their study was conducted. The results of Álvarez Peña and La Rosa Botonero (2021) and Barrera Loja (2020), with lower coefficients (Spearman’s rho of 0.416 and 0.475, respectively), indicate a weaker relationship than that found in our research. This may be because those studies included postgraduate populations, who typically have less dependence on digital platforms for their training, unlike our focus on undergraduate students whose educational experience is more mediated by these technologies.

Finally, Jiménez Chinga and Zeta Vite (2020) reported that quality explains only 45.2 % of student satisfaction, a lower figure than ours. This difference may be due to their focus on overall quality rather than the specific dimensional analysis we conducted of concrete components of digital service.

In this regard, the analysis highlights several key points for improving digital educational services in universities. Student satisfaction depends heavily on how students perceive the institution’s effectiveness.

Among the most important factors is interactivity, as platforms are needed that enable smooth, participatory communication to strengthen the relationship between students and the university. Reliability is also essential, because stable and secure systems are indispensable in a digital environment. Added to this are system quality and responsiveness, which reflect the obligation to ensure efficient technology and timely support. Finally, information quality must be relevant, up-to-date, and accessible, as this is crucial to delivering high-quality education.

A limitation identified in this study was the lack of formal authorization from the university where the research was conducted. Nevertheless, it was considered not strictly necessary, given that the setting operates within a framework of open access to the student population. To safeguard research ethics, confidentiality of information and voluntary student participation were ensured, in accordance with ethical principles in research.

## CONCLUSIONS

It is concluded that digital service quality influences 56.5 % of student satisfaction at a public university in Lima, indicating a positive and significant effect. Additionally, the significant factors were system quality (14.8%), reliability (19.8 %), information quality (12.6 %), responsiveness (13.4 %), and, above all, interactivity (22.8 %), with the latter being the most important factor.

## Recommendation

It is recommended that the university strengthen interactivity in its digital platforms by ensuring stable connectivity, accessibility, data security, and smooth navigation with functions that are useful for students. Likewise, it is essential to guarantee system reliability through secure infrastructure, improve response times, and provide clear, up-to-date, and relevant information. These measures will increase student satisfaction and consolidate high-quality digital education. For future research, comparative analyses across faculties are suggested to capture population diversity, assess technological attributes that influence platform use, and strengthen content communication strategies in order to promote institutional trust.

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#### Correspondence

Roberto Alfonso Franco Ulco

E-mail: roberto.franco@unmsm.edu.pe

## APPENDICES

**Appendix 1***Ranges for the dimensions of digital service quality*

Dimension	Poor	Fair	Good
System quality	4-9	10-15	16-20
Reliability	3-7	8-11	12-15
Security	3-7	8-11	12-15
Accessibility	3-7	8-11	12-15
Service capability	3-7	8-11	12-15
Information quality	4-9	10-15	16-20
Responsiveness	3-7	8-11	12-15
Interactivity	3-7	8-11	12-15