Determinants of student satisfaction based on website information quality

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C H R O N I C L E	A B S T R A C T
	Websites have become the digital showcase for companies, organizations, and people in a globalized world. These platforms are essential for communication, e-commerce, education, and entertainment. The objective of this study is to analyze the relationship between the quality of information on websites and user satisfaction in public higher education in Tarma. This is basic research with a quantitative and correlational approach, carried out with a sample of 428 students of the professional careers of Administration, Nursing, and Agroindustrial Engineering enrolled in 2024 at the Universidad Nacional Autónoma Altoandina de Tarma, located in the Department of Junín. The data were processed and modeled using structural equations based on PLS. The results show a Spearman's Rho correlation coefficient of 0.852 and a significance level of 0.000, which shows a high positive correlation between the variables studied. Likewise, the general hypothesis is confirmed, which establishes a significant relationship between usability, information quality, service interaction quality and user satisfaction of the university website.

1. Introduction

In the digital age, university websites have evolved from a complementary tool to a fundamental pillar for academic communication and management (Anusha, 2014). The quality of the information found on these platforms is essential, as students rely on them to access timetables, academic calendars, bibliographic resources and administrative procedures (Allen et al., 2006). However, many educational institutions face difficulties in ensuring that their content is accurate, relevant, accessible and up-to-date, which can have negative repercussions on satisfaction (Abdallah & Jaleel, 2015). One of the main problems is the lack of up-to-date information. In some cases, websites contain outdated or incorrect data (Nan et al., 2024), which creates confusion and mistrust among students (Inga-ávila et al., 2022). For example, incorrect class schedules or past dates for important procedures can cause significant inconveniences, affecting not only the student experience but also their academic performance (Hidayat et al., 2023). Another challenge is the usability of the platforms. A website with an unintuitive interface, complex navigation or broken links can make it difficult to access information, discouraging students from using this resource. According to (Abdallah & Jaleel, 2015), the perception of the quality of a website is closely related to its design and ease of use, factors that directly influence user satisfaction.

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Accessibility is another critical aspect in a context where universities must be inclusive. Many websites do not meet basic accessibility standards, limiting their use for students with visual, hearing or motor disabilities (Churampi-Cangalaya et al., 2024). The lack of digital accessibility not only violates international regulations, but also affects the perception of equity and inclusion in the institution (Agarwal & Venkatesh, 2002). In addition, information relevance is essential for college students, who need specific and useful information for their academic and extracurricular activities (Churampi-Cangalaya et al., 2023). Clutter of irrelevant content or lack of organization can cause users to waste time searching for what they need, which leads to frustration and reduced satisfaction (Saleh et al., 2022).

The impact of these issues goes beyond the academic. University websites are also a letter of introduction for potential new students, institutional partners, and the community at large. A negative perception about the quality of a website can influence a potential student's decision when choosing a university, affecting the institutional reputation (Ikasari et al., 2022). As for student satisfaction, various studies have shown that it is closely linked to the quality of digital services. Satisfaction not only translates into a better academic experience, but also into a greater sense of belonging and commitment to the university. According to (Hamzah et al., 2022), universities that invest in improving the quality of their websites experience an increase in loyalty from their current students and graduates. Furthermore, the global context has accelerated the digitalization of educational services, which has increased users' expectations regarding the functionality and efficiency of university websites (Inga-Avila et al., 2025). The COVID-19 pandemic highlighted the importance of having robust and reliable digital platforms, since most educational activities have moved to the virtual environment (Cholil et al., 2022). Various studies have analyzed the relationship between web service quality and user satisfaction. Anwarudin et al. (2024) highlight that the shopping experience, design, security, information and communication on travel websites are determinants of online satisfaction. Likewise, the quality of internet service is positively related to customer satisfaction, according to a study published in (Hidayat et al., 2023). Service quality is also defined as the average performance of a telephone or computer network, particularly the performance seen by network users (Cicha & Rutecka, 2022).

In conclusion, the quality of information on university websites is a critical issue that affects both student satisfaction and institutional reputation. Universities must prioritize the continuous improvement of their digital platforms, ensuring that they meet criteria of up-to-dateness, usability, accessibility, and relevance. This will not only improve the student experience, but will also strengthen the relationship between the institution and its community.

Based on the above, the following specific objectives were established: To determine the relationship between usability, quality of information and quality of service interaction with student satisfaction in public higher education in the Province of Tarma – Junín.

2. Literature review

2.1. Website quality

Web service quality refers to the degree to which a website meets the expectations and needs of its users, providing an efficient, effective and enjoyable experience (Aini et al., 2023). This concept encompasses multiple dimensions, including usability, accessibility, reliability, loading speed, security and content quality. Web service quality is a multidimensional construct that directly influences user satisfaction. Organizations must pay attention to these aspects in order to offer digital experiences that meet the expectations of their users and foster positive and lasting relationships. The quality of information also influences the perception of transparency and institutional communication. Students value platforms that allow clear and direct access to relevant university policies, regulations and news. Lack of transparency can generate discontent and even mistrust towards the institution (Sastika et al., 2023).
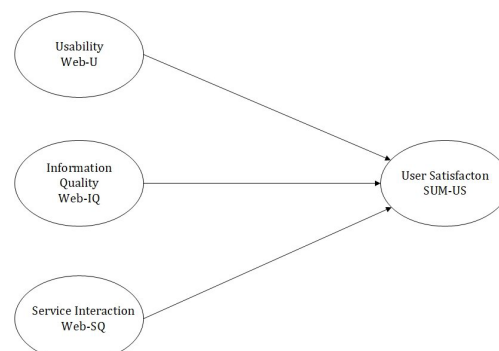

Fig. 1. Webqual Model 4.0 Conceptual Model

WebQual is a widely used model for evaluating the quality of websites from a user perspective. Initially developed by Stuart J. Barnes and Richard T. Vidgen, this framework focuses on measuring how users perceive the effectiveness of a website in terms of its design, functionality, and overall experience (Nan et al., 2024). WebQual is based on three key dimensions: **information quality**, **interaction quality** and **visual design** quality. WebQual 4.0 is an evolved version of the WebQual model, designed to assess the quality of websites from the users' perspective (Anwarudin et al., 2024). This model includes a number of specific dimensions that capture key aspects of user experience. The main elements are described below:

a. Usability: Ease of use, also known as usability, is one of the core dimensions of the WebQual model and refers to the website's ability to allow users to interact with it efficiently, intuitively, and without frustration. This element is crucial to ensuring a positive experience that motivates users to return and use the site frequently. Ease of use not only improves the user experience, but also influences overall satisfaction and repeat use intention. According to Parasuraman et al. (2005), positive perception of usability increases trust in the website and reinforces user loyalty.

b. Information Quality: Information quality is a core dimension in the WebQual model, as it determines the extent to which the content provided by a website meets user expectations and needs (Velasco et al., 2022). This element focuses on attributes such as accuracy, relevance, clarity, completeness, and timeliness of the information presented. Information quality directly impacts user satisfaction and trust towards the website. In a competitive digital environment, users tend to prefer platforms that offer them reliable and relevant content. According to Aladwani & Palvia (2002), the perception of high quality of information improves the overall user experience and fosters their loyalty to the site.

c. Service interaction quality: Service interaction quality is a fundamental dimension in the WebQual model, focusing on the way users experience the service through the website. (Agarwal & Venkatesh, 2002). This concept evaluates not only the technical aspects of the site, but also the tools, functionalities and responses that facilitate the interaction between the user and the platform. The quality of service interaction has a significant impact on the user's overall perception of the website. A high-quality service generates trust, satisfaction and loyalty, resulting in a higher likelihood of recommending the site or using it repeatedly. To measure this dimension, tools such as satisfaction surveys, analysis of user feedback and technical support performance metrics are used (Abdallah & Jaleel, 2015). These methods make it possible to identify areas for improvement and optimize interaction strategies.

2.2. Student satisfaction

Satisfaction derived from the use of websites is defined as the positive perception that users have regarding their experience interacting with a web page. This concept encompasses the extent to which user expectations are met or exceeded, considering factors such as ease of use, quality of information, aesthetics and problem-solving ability (DeLone & McLean, 2003). According to (Surdez-Pérez et al., 2018), satisfaction is based on a comparison between prior expectations and the perceived performance of the service or product. In the context of websites, this translates into an experience that generates trust, comfort and efficiency.

Satisfaction is directly related to the functionality and design of the website. Rojas et al., (2019) highlight that users particularly value intuitive navigation, fast loading times and relevant content. On the other hand, Zhang and Dran (2000) point out that satisfaction not only depends on the technical characteristics of the site, but also on the emotional perception that users have during the interaction. Elements such as personalization and interactivity, according to Cadena-Badilla et al. (2015) can significantly increase the level of satisfaction by creating a more immersive and user-oriented experience.

Finally, satisfaction derived from using websites is also linked to trust and security. (Arras Vota et al., 2016) argue that users are more satisfied when they perceive that the site protects their privacy and ensures secure transactions. It is stressed that a trustworthy and functional design reinforces positive perception of the site (Surdez-Pérez et al., 2018), which encourages loyalty and repeat use. In short, satisfaction on websites is a multifaceted outcome that combines technical, emotional and security aspects to provide a holistic and enriching experience.

2.3. Structural model equations

Structural Equation Modeling (SEM) is an advanced statistical technique used to analyze and model complex relationships between observed and latent variables (Martínez Ávila & Fierro Moreno, 2018). These equations combine elements of regression analysis, factor analysis, and path modeling, allowing multiple dependencies and correlations within a system to be studied simultaneously (Ávila & Fierro Moreno, 2018). In SEM, latent variables (theoretical constructs not directly observable, such as satisfaction or intelligence) are represented by observable indicators, while observed variables are related through paths specified in a theoretical model. The applicability of SEM is broad, spanning disciplines such as psychology, sociology, marketing, and educational sciences (Satria et al., 2024). For example, it can be used to assess the validity of a measurement instrument, identify underlying factors that explain a phenomenon, or test complex hypotheses about causal relationships between constructs (Claudio

et al., 2023). SEM is also useful for longitudinal models, allowing analysis of changes over time, and in multi-group analysis, to compare patterns across populations.

The robustness of SEM lies in its ability to incorporate measurement errors and analyze direct, indirect, and moderating effects (Meza Bernaola et al., 2023). However, its correct implementation requires solid theoretical and statistical knowledge, as well as data of adequate quality and size to ensure reliable and valid results.

3. Methodology

3.1 Research methodology

The research examined the problem and its implications from an analytical perspective (Nicomedes, 2018). A descriptive approach was used with a non-experimental design (Hernández et al., 2014), since the characteristics were analyzed in their natural environment without manipulating variables (Herrera-Rodríguez, 2018). No specific situation was created for the study (González Mares, 2019), since existing situations in the target population were observed. Through inference, relationships were established between the variables studied (Luz et al., 2018). The population consisted of students of the professional careers of Administration, Nursing and Agroindustrial Engineering of the Universidad Nacional Autónoma Altoandina de Tarma, in the province of Junín, who use institutional web platforms for informational, academic and administrative activities. From this population, the corresponding samples were selected (see Table 1). For the selection, a non-probabilistic random sampling was used (Gallardo, 2017), taking into account the restrictions of time, cost and accessibility to the members of the population (Alberto, 2015).

Table 1
Sample of studies from the population

Cluster	Population	Sample
Administration	190	128
Nursing	358	187
Agroindustrial engineering	158	113

3.2 Research model

The model for the present research is presented in Figure 2, which shows the relationship between the dimensions of website information quality (Satria et al., 2024) such as usability, information quality, and service interaction quality (Anusha, 2014).
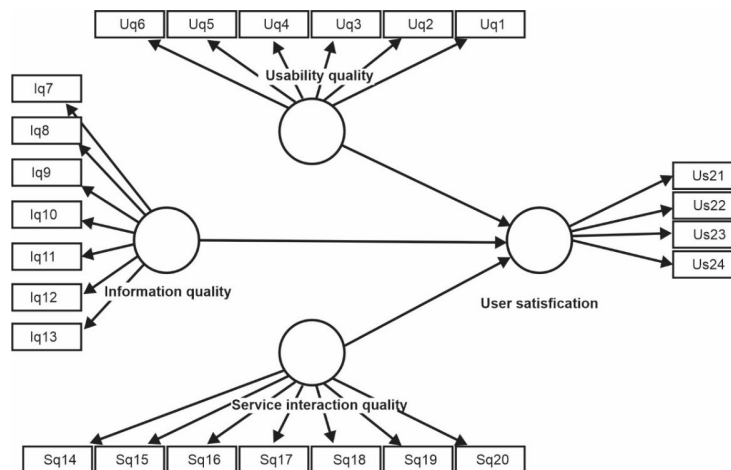

Fig. 2. Research model proposal

Based on the previously described conceptual model, the following specific hypotheses were formulated. These hypotheses seek to establish clear and well-founded relationships between the study variables, providing a structured framework for the analysis and interpretation of the results. Their development responds to the objective of exploring and confirming the proposed theoretical connections, contributing to the advancement of knowledge in the research area:

Specific hypothesis 1 (H1) Determine the relationship between usability and student satisfaction in public higher university education in the Province of Tarma – Junín 2024.

Specific hypothesis 2 (H2) Determine the relationship between information quality and student satisfaction in public university higher education in the Province of Tarma – Junín 2024.

Specific hypothesis 3 (H3) Determine the relationship between the quality-of-service interaction and student satisfaction in public university higher education in the Province of Tarma – Junín 2024

3.3 Data collection and processing process

The data was collected through the survey technique, which allowed the design and use of a specific instrument: The WebQual questionnaire is a tool used to evaluate the quality of websites from the users' perspective, which was made up of 24 questions that cover all dimensions of the research.

The instrument was administered through the digital platforms Google Forms and Microsoft Forms, which facilitated its distribution to the participants of the selected sample. The questionnaire was shared online, allowing respondents to respond autonomously and efficiently. Compliance with ethical principles in research was guaranteed, including informed consent, confidentiality of the data collected, and the anonymity of participants.

Once the responses were obtained, the information was organized into a data matrix for analysis. This matrix was processed using specialized technological tools: Microsoft Excel 2023 for initial data management and basic analysis; SPSS version 27.0, which was used to perform descriptive and statistical analysis; and SmartPLS 4.0 software, used for advanced analyses related to structural equation models. These tools allowed for comprehensive data processing, ensuring accurate and reliable results.

4. Results

4.1 Presentation of collected and processed results

Table 2
Dimensions of website quality

		Usability		Quality of information		Quality of service interaction	
		F	%	F	%	F	%
Website information quality	Deficient	89	21%	145	34%	95	22%
	Regular	194	45%	188	44%	175	41%
	Well	145	34%	95	22%	158	37%
Total		428	100%	428	100%	428	100%

The table presents an analysis of usability, information quality and service interaction quality in a given context. In the usability dimension, 45% of respondents rated the service as "Fair", while 21% rated it as "Poor", indicating significant areas for improvement. Similar trends are observed in information quality, where 44% also rated it as "Fair" and 34% as "Poor". Finally, in service interaction quality, 41% gave a "Fair" rating, although 37% rated it as "Good". These results suggest that, although there are positive aspects, there is an urgent need to optimize the overall service quality and user experience, which may involve strategic interventions in different areas. This indicates that there is a positive correlation between the perception of website quality and the evaluation of the conditions for the development of online education. When users perceive the website as being of good quality, they tend to evaluate these conditions more positively; in terms of volume, the highest proportion of positive evaluations (145 out of 428) is given to the conditions for the development of online education, which could be a sign that users perceive an effort in this area. However, the information quality dimension has the fewest good evaluations (95 out of 428), reflecting a significant weakness that needs to be addressed. The "Fair" and "Poor" levels show a significant gap compared to the "Good" level, especially in the Accessibility and Services criteria, which show the largest percentage differences. This suggests that these areas should be the main focus of improvement to close the performance gap. Furthermore, although the "Good" level already reaches values close to 90% on average, optimizing the weakest points could lead to a more homogeneous performance. This percentage analysis facilitates a clear view of the priorities and allows efforts to be focused on a strategic improvement of the less developed criteria.

The radar chart presents a comparative analysis of three evaluation levels (Poor, Average and Good) in relation to the criteria of Accessibility, Performance, Services and Ease of Use. Based on the scale of the chart, the "Poor" level (blue line) represents approximately 15% of the maximum value across all criteria, reflecting a significantly poor performance. The "Average" level (orange line) reaches an average of 60% across the criteria, showing a considerable improvement over "Poor" but with significant opportunities for optimization. Finally, the "Good" level (grey line) is consistently close to 90% across all four criteria, evidencing an outstanding performance. In the breakdown by criteria, Accessibility shows a significant difference between the levels. The "Good" level reaches 90% of the maximum value, while "Fair" is around 60% and "Poor" does not exceed 25%. Similarly, in Services, the "Good" level reaches 85%, "Fair" is around 55%, and "Poor" barely reaches 20%. As for Performance, the values for "Good", "Fair" and "Poor" are approximately 90%, 65% and 30%, respectively, highlighting a greater gap between the lower

and higher levels. Finally, in the Simplicity criterion, although the "Good" level continues to lead with 85%, the difference with "Fair" (60%) and "Poor" (30%) is less pronounced.
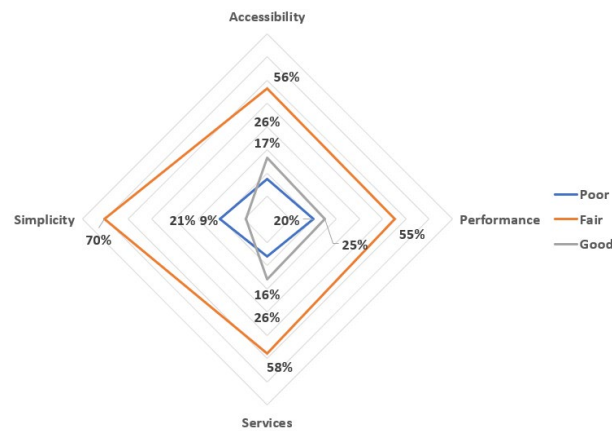

Fig. 3. Dimensions of student satisfaction in public higher education

In conclusion, the "Fair" and "Poor" levels present a significant gap compared to the "Good" level, especially in the Accessibility and Services criteria, which show the largest percentage differences. This suggests that these areas should be the main focus of improvement to close the performance gap. Furthermore, although the "Good" level already reaches values close to 90% on average, optimizing the weakest points could lead to a more homogeneous performance. This percentage analysis facilitates a clear view of the priorities and allows efforts to be focused on a strategic improvement of the less developed criteria.

4.2 Model confirmation

Table 4 presents the validation of the model, where its reliability and validity are confirmed by the analysis of Cronbach's alpha and the composite reliability. According to the data obtained and following the criteria established by the model's internal consistency, it is adequate (Nunnally & Bernstein, 1994), since in all cases the value of Cronbach's alpha exceeds the threshold of 0.9, which indicates a high level of consistency between the items evaluated. In addition, the composite reliability coefficients also show values higher than 0.9, which reinforces the robustness of the model in terms of reliability.

Table 4
Confirmatory model

	Reliability		variance extracted	Discriminating validity			
	Cronbach Alpha	Composite reliability	Average variance extracted (AVE)	Us	Uq	Iq	Sq
User satisfaction	0.935	0.975	0.899	0.996			
Usability	0.905	0.965	0.994	0.991	0.974		
Quality of information	0.912	0.901	0.942	0.988	0.962	0.921	
Service interaction quality	0.922	0.936	0.988	0.975	0.936	0.902	0.878
Reference values	>0.7	>0.7	>0.5				

Regarding the construct validity, this is examined through discriminant validity and convergent validity, following the guidelines proposed by Cepeda and Roldán (2004). To evaluate convergent validity, the AVE coefficient (Average Value) is used. Variance Extracted), which measures the proportion of variance captured by the indicators in relation to the total variance. According to the criteria of Hair et al. (2017), this coefficient must be greater than 0.50 to confirm that the construct adequately explains the variance of its indicators. In summary, the results show that the model meets high standards of reliability and validity, supporting its theoretical and practical soundness.

In the present study, AVE coefficient values greater than 0.57 are observed, which indicates adequate convergent validity, in accordance with the established criteria (Fornell & Larcker, 1981). This suggests that the constructs evaluated explain a significant proportion of the variance of their associated indicators, ensuring their relevance and coherence within the model.

Regarding discriminant validity, this was evaluated using the square roots of the AVE values, which were compared with the correlations between the latent variables, also following the approach proposed by Fornell and Larcker (1981). This procedure ensures that each construct is conceptually distinct from the others and that indicators are more closely associated with their

respective construct than with other constructs in the model. Discriminant validity therefore reinforces the accuracy of the model in distinguishing between the different factors analyzed.

In this context, the results of the analysis of the model used in the study are presented in detail in Table 4, where the items evaluated and the values obtained are shown. These metrics support the structure of the model and confirm its ability to accurately measure the variables and relationships proposed in the theoretical framework of the study. Therefore, the results provide solid empirical evidence supporting both the convergent and discriminant validity of the model.

4.3 Analysis of structural equation models

Based on the results obtained, it can be concluded that hypotheses 1, 2 and 3 have been accepted, since they present significant relationships with user satisfaction (Us). Specifically, the values of the dimensions related to the quality of web information and its impact on user satisfaction are the following: the Usability dimension (Uq) has a coefficient $\beta = 0.232$ with a significance level $p = 0.004$; the Information Quality dimension (Iq) presents a coefficient $\beta = 0.256$ and $p = 0.000$; and the Service Interaction Quality dimension (E) shows a coefficient $\beta = 0.301$ with $p = 0.000$. These results demonstrate that there is a positive and significant relationship between each of these dimensions and user satisfaction, which supports the hypotheses raised in the study. In addition, to evaluate the model fit, the SRMR (Standardized Mean Ratio) was calculated. Root Mean Square Residual), which is an absolute measure of the fit between the predicted and observed correlations. According to Hu and Bentler (Hu & Bentler, 1999), the SRMR value should range from 0 (indicating a perfect fit) to 0.08 (indicating a good fit). In this study, the value obtained for the SRMR was 0.069, suggesting that the model has an adequate fit and meets the standards recommended in the literature.
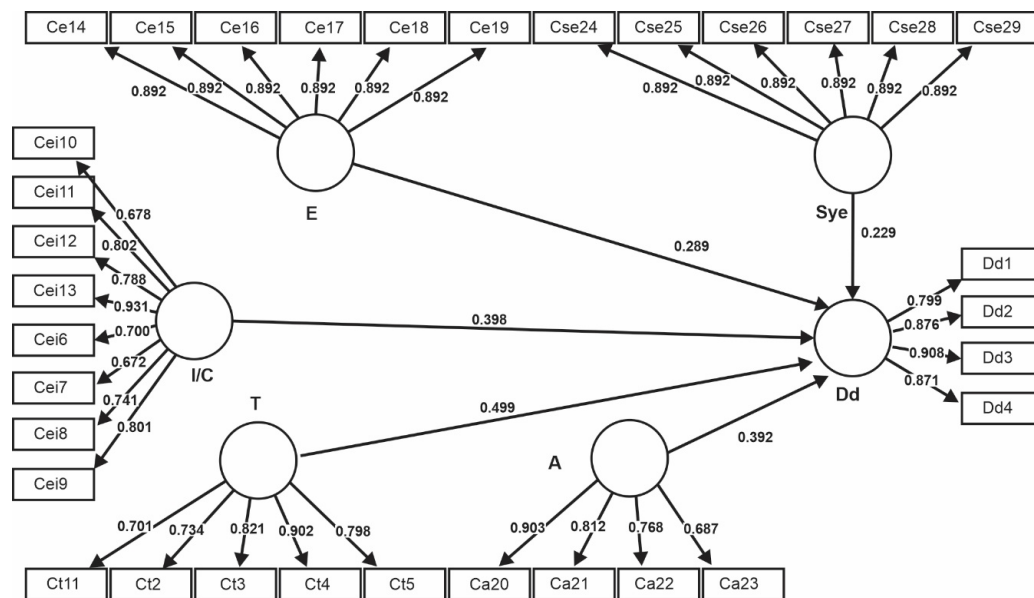

Fig. 4. Confirmatory structural model

According to the results obtained in Fig. 3, the rejection or acceptance of the specific hypotheses formulated was established.

Hypotheses	Mean sample	standard deviation	Path beta value	Student's statistics	p value	Decision
H1 : Uq →Us	0.321	0.287	0.232	2.402	0.004	Accepted
H1 : Iq →Us	0.332	0.199	0.256	2.699	0.000	Accepted
H1 : Sq →Us	0.398	0.299	0.301	2.888	0.000	Accepted

$t > 1.96; p < 0.05$

These findings not only confirm the relevance of the dimensions studied in the perception of user satisfaction, but also validate the proposed model, showing that the dimensions of usability, information quality and service interaction quality are key factors to improve the user experience in the analyzed context. Furthermore, the good fit of the model reinforces the reliability of the

results, providing a solid framework for future research and possible practical applications.

5. Discussion and Conclusion

5.1. Regarding usability and user satisfaction

The study made it possible to confirm the relationship between usability and user satisfaction. This was possible based on the value obtained at the significance level, which was 0.004, and a Spearman correlation coefficient of 0.925.(Martinez et al., 2009) These values show the presence of a very high positive correlation between the variables of the research. The research carried out showed a close relationship between the usability of websites and the satisfaction of university students. The website presents accurate, updated, relevant and easy-to-find information generated higher levels of satisfaction in users; sites with outdated, un-clear or difficult-to-locate information significantly decreased student satisfaction. These results underline the importance of de-signing websites with an intuitive interface and high-quality content to meet the information needs of students in today's digital environment (Alarcon-Sanchez & Llana-Pacori, 2021).

5.2. Regarding the quality of information and user satisfaction

The study made it possible to confirm the relationship between information quality and user satisfaction. This was possible based on the value obtained at the level of significance, which was 0.000, and a Spearman correlation coefficient of 0.879 (Martínez et al., 2009). These values show the presence of a very high positive correlation between the research variables. This demonstrates that information quality is necessary since it is a fundamental aspect in the evaluation and operation of any website, since it directly influences the perception, trust and satisfaction of users (Morales-Vargas, 2022). In a digital environment where users seek rele-vant, reliable and accessible content, information quality determines not only the user experience, but also the success of the website in meeting its objectives, whether commercial, educational or informative, since it affects both the user experience and the reputation of the organization that supports it. Providing accurate, relevant and up-to-date content not only improves user satisfaction, but also strengthens the competitiveness of the site in an ever-evolving digital environment. Therefore, investing in information quality is essential to maximize the impact and benefits of any online platform.

5.3. Regarding the quality of service interaction and user satisfaction

The study made it possible to confirm the relationship between information quality and user satisfaction. This was possible based on the value obtained at the significance level, which was 0.000 and a Spearman correlation coefficient of 0.725 (Martínez et al., 2009). These values show the presence of a positive correlation between the research variables. This demonstrates that the quality of service interaction is necessary since The quality of service interaction is the beating heart of the user experience on a website. In the WebQual model, this dimension stands as a fundamental pillar for measuring customer satisfaction and loyalty. A fluid, efficient and personalized interaction generates a feeling of value and trust in the user, thus increasing the probability that they will become a repeat customer. Beyond simple functionality, the quality of interaction translates into an emotional connection between the user and the brand (Chau Arroé & Mendoza Osorio, 2023). By offering an intuitive and satisfactory experience, companies not only meet the expectations of their customers, but also assume them. This emotional connection is key to generating loyalty and encouraging positive word of mouth, two invaluable assets in the competitive digital world. In short, the quality of service interaction is a differentiating factor that can make the difference between the success and failure of a website (Morales-Vargas, 2021). By investing in improving this dimension, companies not only optimize the user experience, but also strengthen their brand reputation and increase their profitability in the long term. In an increasingly saturated digital environment, the quality of interaction is the key that opens the doors to success.

6. Conclusion

The research showed a close relationship between the quality of information offered on websites and the satisfaction of university students. Those sites that presented accurate, updated, relevant and easy-to-find information generated higher levels of satisfaction in users; sites with outdated, unclear or difficult-to-locate information significantly decreased student satisfaction. These results underline the importance of designing websites with an intuitive interface and high-quality content to meet the information needs of students in today's digital environment.

The quality of information on websites and its relationship with university student satisfaction reveals the importance of having clear, accessible and up-to-date digital platforms, since students value sites that offer relevant content, are easy to navigate and with an intuitive design. It is also concluded that the accuracy of the information is a crucial factor, since it directly impacts the academic experience and decision-making; in addition, efficient interaction with online resources improves the perception of usefulness and reliability.

Overall, the results indicate that high-quality websites increase student satisfaction, promoting student engagement and facilitating

their learning process. Universities are encouraged to invest in the continuous improvement of their platforms to ensure an optimal digital experience; the research also underlines the need for regular evaluations to adjust content and functionality to changing user expectations.

References

Abdallah, S., & Jaleel, B. (2015). Website Appeal: Development of an Assessment Tool and Evaluation Framework of E-Marketing. *Journal of Theoretical and Applied Electronic Commerce Research*, *10*(3), 45–62. https://doi.org/10.4067/S0718-18762015000300005

Agarwal, R., & Venkatesh, V. (2002). Assessing a Firm's Web Presence: A Heuristic Evaluation Procedure for the Measurement of Usability. *Https://Doi.Org/10.1287/Isre.13.2.168.84*, *13*(2), 168–186. https://doi.org/10.1287/ISRE.13.2.168.84

Aini, Q., Fetrina, E., & Epriani, N. C. (2023). WebQual 4.0 Plus: An Approach to Measure Customer Satisfaction toward Website Quality. *2023 11th International Conference on Cyber and IT Service Management, CITSM 2023*. https://doi.org/10.1109/CITSM60085.2023.10455371

Aladwani, A. M., & Palvia, P. C. (2002). Developing and validating an instrument for measuring user-perceived web quality. *Information & Management*, *39*(6), 467–476. https://doi.org/10.1016/S0378-7206(01)00113-6

Alarcon-Sanchez, H., & Llana-Pacori, J. (2021). Implementación de un sistema web para mejorar la calidad de servicio online a los clientes de la empresa Serpar. *Repositorio Institucional - UCV*. https://repositorio.ucv.edu.pe/handle/20.500.12692/86248

Alberto, C. (2015). Los paradigmas de la investigación científica - Scientific research paradigms. *Universidad Femenina Del Sagrado COrazón*, *1*(1), 1–9. https://www.unife.edu.pe/publicaciones/revistas/psicologia/2015_1/Carlos_Ramos.pdf

Allen, M., Currie, L. M., Bakken, S., Patel, V. L., & Cimino, J. J. (2006). Heuristic evaluation of paper-based Web pages: A simplified inspection usability methodology. *Journal of Biomedical Informatics*, *39*(4), 412–423. https://doi.org/10.1016/J.JBI.2005.10.004

Anusha, R. (2014). A Study on Website Quality Models. *International Journal of Scientific and Research Publications*, *4*(12). www.ijsrp.org

Anwarudin, A., Fadlil, A., & Yudhana, A. (2024). Academic Information Systems and User Satisfaction with e-ServQual and WebQual 4.0 Approach Method. *International Journal of Information Science and Management*, *22*(2), 35–54. https://doi.org/10.22034/ijism.2024.1977939.0

Arras Vota, A. M. de G., Gutiérrez Diez, M. del C., & Bordas Beltrán, J. L. (2016). Escenarios de aprendizaje y satisfacción estudiantil en posgrado virtual 2010, 2014 y 2015. *Apertura*, *9*(1), 110–125. https://doi.org/10.32870/ap.v9n1.918

Ávila, M. M., & Fierro Moreno, E. (2018). Aplicación de la técnica PLS-SEM en la gestión del conocimiento: un enfoque técnico práctico. *Revista Iberoamericana Para La Investigación y El Desarrollo Educativo: RIDE, ISSN-e 2007-7467, Vol. 8, Nº. 16, 2018 (Ejemplar Dedicado a: Enero - Junio 2018), Págs. 130-164*, *8*(16), 130–164. https://doi.org/10.23913/ride.v8i16.336

Cadena-Badilla, M., Mejías Acosta, A., Vega-Robles, A., & Vásquez Quiroga, J. (2015). La satisfacción estudiantil universitaria: análisis estratégico a partir del análisis de factores. *Industrial Data*, *18*(1), 9–18. https://doi.org/10.15381/idata.v18i1.12062

Cepeda, G., & Roldán, J. (2004). Aplicando en la práctica la técnica PLS en la administración de empresas (E. Murcia, Trans.). *Congreso de La Asociación Científica de Economía y Dirección de La Empresa*.

Chau Arroé, A., & Mendoza Osorio, A. C. (2023). Influencia de la calidad del servicio online en la satisfacción de los clientes Centennial y Millennial en los hoteles de 3 y 4 estrellas enfocado a los sitios webs. *Repositorio Institucional - Ulima*. https://repositorio.ulima.edu.pe/handle/20.500.12724/18546

Cholil, W., Rahmi, L., Muliawati, A., Jayanta, Wirawan, R., & Irmanda, H. N. (2022). Public Government Web Based Services Quality Assesment Using Webqual And Govqual in Palembang City Government. *Proceedings - 4th International Conference on Informatics, Multimedia, Cyber and Information System, ICIMCIS 2022*, 19–24. https://doi.org/10.1109/ICIMCIS56303.2022.10017884

Churampi-Cangalaya, R. L., Inga-ávila, M. F., Coz, K. R. L., Churampi-Cangalaya, J. J., Huamán-Pérez, F., Caballero, E. M., & Quispe, M. A. (2024). The impact of digital skills on teaching performance in higher education: A meta-analysis. *International Journal of Data and Network Science*, *8*(4), 2185–2192. https://doi.org/10.5267/j.ijdns.2024.6.013

Churampi-Cangalaya, R. L., Inga-ávila, M. F., Huamán-Pérez, F., Peña-Rojas, A. C., Churampi-Cangalaya, J. J., & Ulloa-Ni-Nahuaman, J. (2023). Digital government, institutional development and public higher education. *International Journal of Data and Network Science*, *7*(2), 865–872. https://doi.org/10.5267/j.ijdns.2023.1.002

Cicha, K., & Rutecka, P. (2022). Quality Factors for Agro-touristic Websites—An Exploratory Study. In *Smart Innovation, Systems and Technologies* (Vol. 279). https://doi.org/10.1007/978-981-16-9268-0_40

Claudio, E., Bernaola, M., Peinado, F. Q., & Torres López, C. A. (2023). Modelamiento mediante ecuaciones estructurales (PLS-SEM) de factores clave de la transformación digital. *Contabilidad y Negocios*, *18*(36), 15–36. https://doi.org/10.18800/CONTABILIDAD.202302.006

DeLone, W. H., & McLean, E. R. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update. *Journal of Management Information Systems*, *19*(4), 9–30. https://doi.org/10.1080/07421222.2003.11045748

Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and Measurement Error.

Journal of Marketing Research, *18*(1), 39. https://doi.org/10.2307/3151312

Gallardo, E. (2017). *Metodología de la Investigación* (Universidad Continental, Ed.; Primera, Vol. 1). Universidad Continental. http://www.continental.edu.pe/

González Mares, M. (2019). Metodología de la investigación. Las rutas cuantitativa, cualitativa y mixta. *Revista Universitaria Digital de Ciencias Sociales (RUDICS)*, *10*(18), 92–95. https://doi.org/10.22201/FESC.20072236E.2019.10.18.6

Hamzah, M. L., Rahmadhani, R. F., & Purwati, A. A. (2022). An Integration of Webqual 4.0, Importance Performance Analysis and Customer Satisfaction Index on E-Campus. *Journal of System and Management Sciences*, *12*(3), 25–50. https://doi.org/10.33168/JSMS.2022.0302

Hernández, R., Fernández, C., & Baptista, M. D. P. (2014). Metodología de la investigación. *Metodología de La Investigación*, 91. https://dialnet.unirioja.es/servlet/libro?codigo=775008&info=resumen&idioma=SPA

Herrera-Rodríguez, J. I. (2018). Las prácticas investigativas contemporáneas. Los retos de sus nuevos planteamientos epistemológicos. *Revista Scientific*, *3*(7), 6–15. https://doi.org/10.29394/scientific.issn.2542-2987.2018.3.7.0.6-15

Hidayat, N., Afuan, L., Nurhayati, S., & Kurniawan, Y. I. (2023). Evaluation of the Universitas Jenderal Soedirman e-learning website (Eldiru) using the WebQual 4.0 method. *AIP Conference Proceedings*, *2482*. https://doi.org/10.1063/5.0110501

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*(1), 1–55. https://doi.org/10.1080/10705519909540118

Ikasari, D., Widiastuti, & Andika, R. (2022). The Quality Analysis of Smart Zoning Application Web Using Webqual and Importance Performance Analysis Method, Case Study Election of Senior High School in Depok. *HORA 2022 - 4th International Congress on Human-Computer Interaction, Optimization and Robotic Applications, Proceedings*. https://doi.org/10.1109/HORA55278.2022.9799927

Inga-Avila, M., Churampi-Cangalaya, R. L., Ulloa Ninahuaman, J., Mendoza Caballero, E., Soto Cardenas, F. O., Visurraga Camargo, L. A., & Salas Matos, T. J. (2025). Digital talent and job satisfaction in the administrative staff of a public university with WarpPLS 8.0. *Decision Science Letters*, *14*(1), 169–178. https://doi.org/10.5267/j.dsl.2024.10.003

Inga-ávila, M. F., Churampi-Cangalaya, R. L., Uribe-Hinostroza, M., Aliaga-Sandoval, C. G., Huamán-Pérez, F., & Peña-Rojas, A. C. (2022). Determinants of university students' satisfaction with information technology based classroom use by pandemic Covid19. *International Journal of Data and Network Science*, *6*(4), 1567–1576. https://doi.org/10.5267/j.ijdns.2022.4.020

Luz, S., Mendoza, H., Irasema, T., & Monroy, S. (2018). Enfoques de la Investigación. *Boletín Científico de Las Ciencias Económico Administrativas Del ICEA*, *7*(13), 67–68. https://doi.org/10.29057/ICEA.V7I13.3519

Martínez Ávila, M., & Fierro Moreno, E. (2018). Aplicación de la técnica PLS-SEM en la gestión del conocimiento: un enfoque técnico práctico / Application of the PLS-SEM technique in Knowledge Management: a practical technical approach. *RIDE Revista Iberoamericana Para La Investigación y El Desarrollo Educativo*, *8*(16), 130–164. https://doi.org/10.23913/ride.v8i16.336

Martinez, R., Tuya, L., Martinez, M., Pérez, A., & Cánovas, A. (2009). El coeficiente de correlación de los rangos de spearman caraterización. *Revista Habanera de Ciencias Médicas*, *8*(2), 1–8. http://www.redalyc.org/articulo.oa?id=180414044017

Meza Bernaola, E. C., Quiñones Peinado, F., & Torres López, C. A. (2023). Modelamiento mediante ecuaciones estructurales (PLS-SEM) de factores clave de la transformación digital. *Contabilidad y Negocios*, *18*(36), 15–36. https://doi.org/10.18800/contabilidad.202302.006

Morales-Vargas, A. (2021). *Evaluación de calidad en sitios web: factores de análisis, métodos y propuesta de un modelo para el desarrollo de nuevos instrumentos*. 1. https://dialnet.unirioja.es/servlet/tesis?codigo=310468&info=resumen&idioma=SPA

Morales-Vargas, A. (2022). Síntesis. Evaluación de calidad en sitios web: factores de análisis, métodos y propuesta de un modelo para el desarrollo de nuevos instrumentos. *Hipertext.Net*, *24*, 83–95. https://doi.org/10.31009/HIPERTEXT.NET.2022.I24.07

Nan, Z. H., Lv, S., Sheng, C., & Zhou, W. (2024). Analyzing the Impact of Agricultural Products E-commerce Websites on Consumer Perceived Risk and Purchase Intention Based on the WebQual Model and the E-S-QUAL Model. *ACM International Conference Proceeding Series*, 570–574. https://doi.org/10.1145/3671151.3671252

Nicomedes, E. (2018). Tipos de investigación. *Universidad Santo Domingo de Guzmán*, 1–4. https://core.ac.uk/outputs/250080756/?utm_source=pdf&utm_medium=banner&utm_campaign=pdf-decoration-v1

Nunnally, J., & Bernstein, I. (1994). La evaluación de la fiabilidad. Teoría psicométrica. *Publicaciones de Investigación Científica*, *3*, 248. https://www.scirp.org/reference/ReferencesPapers?ReferenceID=1960143

Rojas, E. G., Campos, J. F. A., Garrido, J. D. A., Cobaxin, M. F. G., Laureano, K. J. A., Jiménez, C. R., & Cadena, F. de J. O. (2019). Satisfacción de estudiantes en medicina con desempeño docente y tutorías académicas. *Investigación En Educación Médica*, *30*(2), 60–67. https://doi.org/10.22201/facmed.20075057e.2019.30.1891

Saleh, A. H., Yusoff, R. C. M., Bakar, N. A. A., & Ibrahim, R. (2022). Systematic literature review on university website quality. *Indonesian Journal of Electrical Engineering and Computer Science*, *25*(1), 511–520. https://doi.org/10.11591/ijeecs.v25.i1.pp511-520

Sastika, W., Kusumahadi, K., Hanifa, F. H., & Marcelino, D. (2023). E-Commerce Website Quality: Usability, Information, Service Interaction & Visual Quality on Customer Satisfaction. *2023 11th International Conference on Cyber and IT Service Management, CITSM 2023*. https://doi.org/10.1109/CITSM60085.2023.10455542

Satria, E., Tresnawati, D., Husniah, H., Gumilar, S., Najata, S. A., & Asyah, C. C. N. (2024). Measuring Service Quality and

Loyalty of Aisnet for Student Users Using Webqual 4.0 with IPA and PLS-SEM Methods. *11th International Conference on ICT for Smart Society: Integrating Data and Artificial Intelligence for a Resilient and Sustainable Future Living, ICISS 2024 - Proceeding*. https://doi.org/10.1109/ICISS62896.2024.10751476

Surdez-Pérez, E., Sandoval-Caraveo, M., & Lamoyi-Bocanegra, C. (2018). Satisfacción estudiantil en la valoración de la calidad educativa universitaria. *Revista de Educación*, *21*(362), 9–26. https://doi.org/10.4438/1988-592x-re-2013-362-23

Velasco, E., Alonso, O. K., Pereda Herrero, V., Velasco, E., Alonso, O. K., & Pereda Herrero, V. (2022). Diseño y validación de un modelo de análisis de sitios web. *Logos (La Serena)*, *32*(1), 70–90. https://doi.org/10.15443/RL3205

Zhang, P., & Dran, G. M. (2000). Satisfiers and dissatisfiers: A two-factor model for Website design and evaluation. *Journal of the American Society for Information Science*, *51*, 1253–1268. https://doi.org/10.1002/1097-4571(2000)9999:9999<::AID-ASI1039>3.0.CO;2-O