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A QUALIDADE DO SERVIÇO EDUCACIONAL COMO PREDITORA DA PERCEPÇÃO DA SATISFAÇÃO ACADÉMICA EM ESTUDANTES DE UMA UNIVERSIDADE EQUATORIANA

EDUCATIONAL SERVICE QUALITY AS A PREDICTOR OF ACADEMIC SATISFACTION PERCEPTION AMONG UNIVERSITY STUDENTS IN ECUADOR

LA CALIDAD DEL SERVICIO EDUCATIVO COMO PREDICTOR DE LA PERCEPCIÓN DE SATISFACCIÓN ACADÉMICA EN ESTUDIANTES DE UNA UNIVERSIDAD ECUATORIANA

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RESUMO

Introdução: A qualidade do serviço educacional tem como objetivo satisfazer os interesses e expectativas dos estudantes.
Objetivo: Avaliou a qualidade do serviço educacional como preditora da percepção da satisfação académica em estudantes de uma universidade equatoriana, utilizando o instrumento SERVQUALing.
Métodos: Foi empregue um desenho de pesquisa não experimental e transversal. Uma pesquisa foi aplicada a 205 estudantes matriculados nos cursos de Agronomia e Medicina Veterinária. Realizou-se uma Análise de Componentes Principais (ACP) para identificar as dimensões da satisfação acadêmica que melhor explicam a qualidade educacional.
Resultados: A Análise de Componentes Principais mostrou que as variáveis que explicam a qualidade foram: o tempo dedicado pelos professores para responder perguntas e oferecer soluções rápidas e satisfatórias dentro da dimensão de Capacidade de Resposta, e as variáveis sobre satisfação no desenvolvimento das aulas e tempo de realização das atividades dentro da dimensão de Confiabilidade**.**
Conclusão: A perceção dos estudantes destaca a capacidade de resposta, confiabilidade, empatia e elementos tangíveis como aspectos-chave da qualidade educacional. Melhorar a disponibilidade dos professores, a gestão do tempo, o desenvolvimento das aulas e a empatia, ao mesmo tempo em que se abordam os baixos níveis de satisfação no atendimento ao estudante e na organização dos horários, pode fortalecer a qualidade educacional como um todo.

Palavras-chave: análise de componentes principais; satisfação educacional; parâmetros de qualidade do serviço

ABSTRACT

Introduction: The quality of the educational service aims to satisfy the interests and expectations of students.
Objective: It evaluated the quality of the educational service as a predictor of the perception of academic satisfaction in students at an Ecuadorian university, using the SERVQUAL instrument.
Methods: A non-experimental cross-sectional research design was employed. A survey was administered to 205 students enrolled in the Agronomy and Veterinary Medicine programs. A Principal Component Analysis (PCA) was conducted to identify the dimensions of academic satisfaction that best explain educational quality.
Results: The Principal Components Analysis showed that the variables that explain the quality were: time dedicated by teachers to answer questions and to offer quick and satisfactory solutions within the Responsiveness dimension, and the variables on satisfaction in the development of the class and time of development of activities in the dimension of Reliability.
Conclusion: Student perceptions highlight responsiveness, reliability, empathy, and tangible elements as key to educational quality. Improving faculty availability, time management, class development, and empathy while addressing low satisfaction with student attention and scheduling can enhance overall quality.

Keywords: principal component analysis; educational satisfaction; service quality parameters

RESUMEN

Introducción: La calidad del servicio educativo tiene como objetivo satisfacer los intereses y expectativas de los estudiantes.
Objetivo: Se evaluó la calidad del servicio educativo como predictor de la percepción de satisfacción académica en estudiantes de una universidad ecuatoriana, utilizando el instrumento SERVQUALing.
Métodos: Se empleó un diseño de investigación no experimental y transversal. Se aplicó una encuesta a 205 estudiantes matriculados en los programas de Agronomía y Medicina Veterinaria. Se realizó un Análisis de Componentes Principales (ACP) para identificar las dimensiones de la satisfacción académica que mejor explican la calidad educativa.
Resultados: El Análisis de Componentes Principales mostró que las variables que explican la calidad fueron: el tiempo dedicado por los docentes para responder preguntas y ofrecer soluciones rápidas y satisfactorias dentro de la dimensión de Capacidad de Respuesta, y las variables sobre satisfacción en el desarrollo de la clase y tiempo de realización de actividades dentro de la dimensión de Confiabilidad.
Conclusión: La percepción estudiantil destaca la capacidad de respuesta, confiabilidad, empatía y elementos tangibles como aspectos clave de la calidad educativa. Mejorar la disponibilidad del profesorado, la gestión del tiempo, el desarrollo de las clases y la empatía, al mismo tiempo que se abordan los bajos niveles de satisfacción en la atención al estudiante y la planificación horaria, puede fortalecer la calidad educativa en general.

Palabras Clave: análisis de componentes principales; satisfacción educativa; parámetros de calidad de servicio

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INTRODUCTION

Educational quality encompasses aspects related to the structure of the educational system that aim to ensure the necessary conditions for the development of the teaching and academic training process, thereby meeting the interests and expectations of students (Bordero-Delgado, 2014). The quality of educational and learning services must guarantee the academic preparedness of instructors, which, along with relevant content, ensures access to knowledge and competencies for future professionals, equipping them with innovation and creativity skills aligned with societal changes (United Nations Educational Organization, 2014). Concurrently, these aspects must be integrated with educational policies that promote resource flow, adequate infrastructure, innovation in the teaching-learning process, and academic offerings that align with societal realities. This integration positively impacts both educational quality and student satisfaction (Noben et al., 2020; Olmos-Gómez et al., 2021).

In the university context, students are considered primary users and, therefore, constitute a key element in assessing the quality of educational services (Mori & Palomino, 2021). Academic satisfaction is important as it seeks to quantify its favorable impact on student training, personal development, and motivation (Díaz-Camacho et al., 2021; Ventura-León et al., 2021). Given the relevance of academic satisfaction in terms of educational quality, Lescano et al. (2021) analyzed the influence of student satisfaction levels concerning high-quality professional training by conducting a survey among a sample of 7,180 students from various faculties. They determined that more than 83.2% of university students expressed satisfaction with the quality of their professional training, positively influencing overall educational quality.

Similarly, Andrey Bernate et al. (2020) found that, in terms of satisfaction, seventh- and eighth-semester university students prioritized aspects related to institutional services, economic conditions, the teaching and learning process, and physical infrastructure. This underscores the importance of evaluating educational processes to enhance educational quality. Conversely, Bernal et al. (2017) observed that the high percentage of satisfaction regarding university major selection was strongly correlated with student retention. This was primarily due to the faculty's knowledge and expertise in content mastery, while less importance was placed on clarity of expression, and assessment techniques, and no significance was given to the student-teacher relationship, class schedules, transportation, and the physical environment. Lastly, findings by Mwiya et al. (2017) demonstrated a positive relationship between quality performance dimensions—measured in terms of tangibility, reliability, responsiveness, empathy, and security—and overall satisfaction based on the application of the Service Performance Model (SERVPERF).

In Ecuador, there are few studies related to this topic. Zapatier-Castro and D'Armas-Regnault (2019) evaluated students' perceptions of teaching quality at an Ecuadorian university. They also characterized the student profile to facilitate the design of strategic plans for institutional improvement, identifying, through multivariate analysis, Teaching Competencies as one of the key determinants of teaching service quality, along with Organizational Structure, Physical Components, and Holistic Development. Likewise, Armas Benavides and Pérez Cárdenas (2017) analyzed academic satisfaction with education quality among 308 students from the Faculty of Psychological Sciences. They found that 49.4% of respondents moderately agreed with the quality of education, with an average score of 3.23, while academic satisfaction had an average rating of 3.66, demonstrating that 66.9% of students felt academically satisfied.

Despite the significance of evaluating student satisfaction to ensure academic success and retention, no studies to date have examined student satisfaction perceptions regarding academic quality among future agricultural professionals in Ecuador. In this regard, the present study aims to determine the role of educational quality as a predictor of academic satisfaction perception among students of the Faculty of Agricultural Sciences at an Ecuadorian university.

1. METHODS

In this study, the quality of education was assessed in the Veterinary Medicine and Agronomy programs at a university in Ecuador. A non-experimental cross-sectional research design was employed. This design is characterized by data collection at a single point in time, aiming to describe variables and analyze their incidence and interrelation at a given moment (Arias, 2012; Hernández-Sampieri & Mendoza, 2018).

1.1 Sample size

A sample of 205 students enrolled in the Agronomy and Veterinary Medicine programs at levels V to VIII was selected, considering a sampling error of 5% with a 95% confidence level. The inclusion and exclusion criteria were as follows:

- **Inclusion criteria**: Students enrolled in the Faculty of Agricultural Sciences (Agronomy and Veterinary Medicine), regularly attending the fifth, sixth, seventh, or eighth semester.
- **Exclusion criteria**: Students from the first to the fourth semester, and students enrolled in the continuing education regime.

A simple random sampling method was used, ensuring that all individuals in the population had an equal chance of being selected (Reales Chacón et al., 2022).

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1.2 Data collection technique

A survey was administered to collect data for subsequent statistical analysis (Hernández-Sampieri & Mendoza Torres, 2018; Rojas-Crotte, 2011). According to Cisneros-Caicedo et al. (2022) and Hernández-Sampieri & Mendoza Torres (2018), a data collection instrument must demonstrate reliability, validity, and objectivity. Reliability refers to the instrument's ability to yield consistent and coherent results, while validity indicates the extent to which the instrument accurately measures the intended variable.

The survey instrument was developed using Google Forms and distributed to selected students via their institutional email accounts. It was validated using Cronbach's alpha coefficient to assesses the internal consistency of items (Amirrudin et al., 2020) (Table 1). Prior to the administration survey, informed consent was obtained from all participants.

Table 1 - Cronbach's alpha

Cronbach's Alpha	Cronbach's Alpha based on standardized items	Number of Items
0,923	0,927	22

1.3 Statistical analysis

Academic quality was measured using the SERVQUALing instrument. A Principal Component Analysis (PCA) was conducted to identify the dimensions of academic satisfaction that best explain educational quality using SPSS software, version 22. The primary statistical criterion applied was the Kaiser criterion, which involves retaining components with eigenvalues greater than 1. After extraction, the variables with high loadings (typically > 0.6) on each component were used to interpret the underlying dimensions of educational quality.

2. RESULTS

The majority (86.8%) fell within the 20–25 age range, including 66.8% were female and 33.1% males. Most participants coming from the province of Tungurahua (46.8%), followed by Chimborazo, Cotopaxi, and Pichincha (9.8% each) (Table 2).

Table 2 - Sociodemographic characteristics of students from the Faculty of Agricultural Sciences

Sociodemographic Variable	Frequency (%)
Gender	
Female	137 (66,8%)
Male	68 (33,1%)
Age range (years)	
20 – 25	178 (86,8%)
26 – 29	27 (13,2%)
Place of birth	
Tungurahua	96 (46,8%)
Chimborazo	20 (9,8%)
Cotopaxi	20 (9,8%)
Pichincha	20 (9,8%)
Pastaza	14 (6,8%)
Sucumbíos	14 (6,8%)
El Oro	7 (3,4%)
Orellana	7 (3,4%)
Santo Domingo de los Tsáchilas	7 (3,4%)

According to the principal component analysis (PCA), a high percentage of the variance was explained by the first three components (69.12%) (Table 3). However, most of the quality-related variables were concentrated in the first component, where the highest-weighted variables were: the time dedicated by instructors to answering students' questions (0.917) and the ability of instructors to provide prompt and satisfactory solutions to students (0.872) within the Responsiveness dimension. Additionally, variables related to conducting lessons effectively (0.875) and time management in the development of activities (0.889) were highlighted within the Reliability dimension (Table 4).

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Table 3 - Eigenvalues of Principal Components related to educational quality variables

Component	Total	Percentage of Variance	Cumulative Percentage
1	10.931	49.69	49.70
2	2.579	11.72	61.41
3	1.696	7.71	69.12
4	10.198	50.44	74.56
5	10.040	40.73	79.29
6	00.842	30.83	83.11
7	00.804	30.65	86.77
8	00.722	30.28	90.05
9	00.511	20.32	92.37
10	00.407	10.85	94.22
11	00.337	10.53	95.75
12	0.256	10.16	96.91
13	0.167	0.76	97.67
14	0.138	0.63	98.30
15	0.108	0.49	98.79
16	0.091	0.41	99.20
17	0.076	0.35	99.55
18	0.042	0.19	99.74
19	0.036	0.16	99.90
20	0.016	0.07	99.97
21	0.006	0.03	100.00

Table 4 - Principal Components explaining educational quality variables

Variable	Component 1	Component 2	Component 3
The teacher is never too busy to answer students' questions.	0.917	0.102	0.184
The teacher adheres to the scheduled time for academic activities.	0.889	-0.245	-0.026
The teacher conducts classes in a satisfactory manner.	0.875	0.125	0.236
The teacher provides quick and satisfactory solutions to students.	0.872	0.039	0.230
The teacher understands students' specific needs.	0.865	-0.424	0.022
When a student has a problem, the teacher shows genuine interest in helping solve it.	0.864	-0.126	0.071
The teacher tries to stay up to date with their knowledge.	0.833	-0.309	0.246
The physical facilities are visually appealing.	0.829	-0.311	0.283
The instructional support materials used by teachers (brochures, documents, etc.) are visually appealing and useful.	0.812	-0.082	0.368
Teachers provide personalized attention to their students.	0.802	0.316	-0.207
The teacher demonstrates confidence in the classroom.	0.796	0.030	-0.247
Teachers are always friendly toward their students.	0.675	0.089	-0.326
Teachers maintain a neat and professional appearance.	0.637	-0.527	-0.293
The teacher informs students about academic activities (classes, practical sessions, assessments).	0.627	0.155	-0.297
Teachers are willing to provide academic guidance to their students.	0.594	0.115	-0.257
Teachers care about the best interests of their students.	0.590	0.561	0.256
Teachers have sufficient knowledge to answer students' questions.	0.555	0.447	0.016
The institution has modern equipment.	0.526	-0.517	-0.367
Teachers give individualized attention to their students.	0.371	0.667	-0.401
Teachers' behavior conveys trust to their students.	-0.055	0.247	0.651
Students feel safe in their interactions with teachers.	0.401	0.425	0.051
Teachers have work schedules that are convenient for all students.	0.355	0.453	-0.184

Also, several variables related to the Empathy, Reliability, and Tangible Elements dimensions also gained attention from respondents. Among the Empathy variables, students considered it relevant that instructors understand their specific needs (0.865) and provide personalized attention (0.802). Regarding Reliability, students valued instructors' willingness to address student concerns (0.864) and their commitment to staying updated in their knowledge (0.833). Within Tangible Elements, students emphasized the importance of visually appealing physical facilities (0.829) and the attractiveness and usefulness of instructional materials such as brochures and documents (0.812).

Other variables identified as important through PCA included the instructor's confidence during lessons (0.796), kindness in interacting with students (0.675), professional appearance (0.637), and effort in communicating academic activities (e.g., classes, practical exercises, and assessments) (0.627).

Conversely, the variables deemed least significant for academic quality included instructors' willingness to provide academic guidance, concern for students' best interests, knowledge level in responding to students' questions, and the institution's provision

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of modern and aesthetically appealing equipment. These factors were categorized as Responsiveness, Empathy, Assurance, and Tangible Elements, respectively (Table 4).

The results of the PCA also supported the feasibility of performing factor analysis (KMO 0.845; Bartlett test of sphericity: χ_{204}=6284.01, P<0.000).

3. DISCUSSION

This research examined how academic factors and student services influence the satisfaction of students in Agronomy and Veterinary Medicine programs at one Ecuadorian university by using SERVQUAL. SERVQUAL is a leading tool for evaluating the quality of educational services across various disciplines and is recommended for inclusion in higher education quality assessments (Aboubakr et al., 2022).

Consistent with previous studies, this research demonstrates that the variables related to the Responsiveness and Reliability dimensions positively influence student satisfaction. In a similar study conducted in Ecuador at the Faculty of Political and Administrative Sciences of the National University of Chimborazo, using the SERVQUAL model, found that Responsiveness was the most important factor, followed by Empathy, Assurance, and Reliability (Uquillas-Granizo et al., 2022).

The study results agree some prior studies, which found teacher quality to be a major factor influencing student satisfaction (Nguyen et al., 2024). Additionally, Marcano and Uribe (2022) found that the highest levels of academic satisfaction were linked to cognitive skill development, knowledge construction processes, and the implementation of innovative assessment strategies by instructors. Similarly, a study aimed at evaluating the quality of educational services among dentistry and nursing students using the SERVQUAL model found that the mean reliability score was highest among all quality dimensions (3.79), followed by tangible dimensions (3.73) (Aboubakr & Bayoumy, 2022). Similarly, a study to assess students' perceptions of educational service quality at Zahedan University of Medical Sciences (ZAUMS) in Iran, using the SERVQUAL model indicated that 87%of students rated the service quality as average, 11.2% as poor and 1.8% as good, suggesting that the current educational service quality at ZAUMS is moderate and that effective plans should be implemented to improve it (Shahroudi et al. 2019).

On the other hand, the study did not find significant effects of physical amenities on student satisfaction. Probably, the physical facilities are not considered to be relatively important by students as their primary focus may be in quality of academic programs and student support services (Bahadur et al., 2024). This is in corroboration with evidence that physical facilities may not contribute to satisfaction of students (Amoako et al., 2023).

Based on these findings, the authors emphasized the importance of evaluating higher education quality through the development of students' knowledge and creative skills since understanding the quality of education and the complexity of the evaluation process is an essential step toward developing and implementing appropriate actions. Consequently, the quality perception among students can be improved by reinforcing staff capabilities through continuous training opportunities and open communication with students, to encourage students to share ideas for education planning and reform. Finally, this research should be replicated to examine the changes in students' expectations and perceptions and identify new needs and trends through the use of random sampling techniques.

CONCLUSION

Student perceptions regarding key aspects of educational quality indicate that responsiveness, reliability, empathy, and tangible elements are crucial factors for improvement. Key variables include faculty availability for student inquiries, effective time management, satisfactory class development, rapid problem resolution, and faculty empathy. Conversely, the lowest satisfaction levels were observed regarding individualized student attention, student trust in faculty behaviour, faculty-student interactions, and inconvenient class schedules. These findings suggest that addressing these areas could enhance student perceptions and overall educational quality.

These findings underscore the need for targeted reforms to enhance educational quality in Ecuadorian universities. By prioritising key dimensions such as responsiveness, reliability, and empathy, institutions can significantly improve student satisfaction and engagement. Strengthening the reliability of teaching practices via clear academic standards and consistent performance evaluations will ensure a coherent and high-quality educational experience. Equally, fostering empathy through emotional intelligence training and mentoring programmes will support more personalised academic guidance.

The study also highlights the limited perceived impact of physical infrastructure on educational quality. Therefore, universities should consider reallocating resources towards faculty development and curricular innovation, focusing on functional and digital enhancements rather than aesthetic improvements.

To ensure sustained improvement, institutions should establish internal quality assurance mechanisms and regularly apply validated tools such as SERVQUAL and Principal Component Analysis to capture evolving student perceptions under a more inclusive, responsive, and high-quality educational environment aligned with student expectations and future professional demands.

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AUTHORS' CONTRIBUTION

Conceptualization, R.A. and G.R.; data curation, R.A. and P.N.; formal analysis, R.A., G.R. and P.N.; funding acquisition, R.A.; investigation, R.A. and P.N.; methodology, R.A. and G.R.; project administration, R.A., G.R. and P.N.; resources, R.A.; software, R.A. and P.N.; supervision, G.R.; validation, R.A. and G.R.; visualization, R.A., G.R. and P.N.; writing-original draft, R.A., G.R. and P.N.; writing-review and editing, R.A., G.R. and P.N.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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