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Mediating role of service quality between university social responsibility and student satisfaction in Peru

Isac Fernando Espinoza Montes, Nérida Pilar Zevallos Cárhuaz, Martin Romeo Yurivilca Oscanoa
Faculty of Administrative Sciences, Universidad Nacional del Centro del Peru, Huancayo, Peru

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ABSTRACT

This study analyzed the influence of university social responsibility (USR) on student satisfaction (SS), mediated by service quality (SQ). It is relevant because it provides empirical evidence of how socially responsible practices strengthen educational quality and student well-being in a Latin American context that remains underexplored through structural equation modeling (SEM). The objective was to explain how USR affects SS through SQ, using SEM. Specifically, the study examined the direct effect of USR on SS, its influence on SQ, the impact of SQ on satisfaction, and the mediating role it plays in this relationship. A quantitative, non-experimental, cross-sectional design was employed with a sample of 505 undergraduate students from five Peruvian public and private universities, selected through non-probability convenience sampling. Data were collected using three validated and reliable Likert-type scales. The results showed that USR significantly influenced SQ (R^2=0.60) and that SQ predicted SS (R^2=0.67), confirming a partial mediation effect. The findings provide practical implications for strengthening institutional policies to enhance SQ and increase SS.

Corresponding Author:

Isac Fernando Espinoza Montes
Faculty of Administrative Sciences, Universidad Nacional del Centro del Peru
Av. Mariscal Castilla No. 3909, Huancayo 12006, Peru
Email: ifespinoza@uncp.edu.pe

1. INTRODUCTION

Higher education faces the challenge of training professionals who not only master scientific knowledge but also uphold their social and environmental commitments. This perspective, promoted by international organizations such as UNESCO, has established university social responsibility (USR) as a central pillar in shaping national identity [1]. USR transcends traditional academic functions; it integrates fundamental values such as dignity, freedom, citizenship, social equity, and environmental sustainability into all university operations [2]. It represents the active commitment of universities to incorporate social and environmental concerns, promoting the well-being of their community and society through quality educational services [3], [4]. This commitment constitutes an investment in human capital and in the strengthening of relationships with stakeholders [1], [2], [5].

Recent studies confirm that this approach fosters student satisfaction (SS) by promoting a socially engaged and student-centered educational experience [6]–[8]. To assess this institutional commitment, service quality (SQ) and SS are essential indicators. Both variables capture students' perceptions of the tangible and intangible aspects of their university experience and are fundamental for assessing institutional performance from a perspective focused on academic well-being. SS is defined as a student's perception of the extent to which their educational experiences meet or exceed their expectations [6], reflecting the efficiency of academic and administrative services as perceived through the effectiveness, reliability, and

responsiveness of institutional support within higher education environments [7], [8]. Similarly, SQ measures the university's ability to meet students' demands and expectations, acting as a key predictor of satisfaction [7], [9], [10]. Recent research indicates that students value specific aspects such as infrastructure, employability, and skills development when evaluating SQ [11].

International studies have documented a significant relationship between USR and SS. This link has been observed in Spanish universities [12], [13], while structural models applied to Asian universities have concluded that USR directly influences satisfaction [4]. Likewise, research has demonstrated that service dimensions such as teaching management and academic programs directly impact SS [14]. However, despite this growing body of evidence, Latin American universities-particularly those in Peru-remain underrepresented in global analyses. Peru presents a distinctive case because its higher education system is currently undergoing major reforms aimed at ensuring quality, accreditation, and social accountability. Although empirical evidence remains limited, recent studies in the Peruvian context have confirmed that perceived SQ strongly predicts SS, reinforcing the strength of the SQ-SS relationship in the region [15]. These transformations make Peru an ideal context for testing and contrasting international models of university responsibility and understanding how social responsibility translates into educational quality and student well-being.

These findings support our first hypothesis (H1): USR has a positive influence on SS. In addition to this direct effect, it has been proposed that SQ mediates the relationship between USR and SS. SQ is understood as students' assessment of academic and administrative services based on criteria such as efficiency, accessibility, equity, and care [7]. Institutions with a social commitment tend to provide more effective and innovative services, thereby strengthening student trust [4]. In this regard, evidence confirms that SQ channels the effect of USR on satisfaction, supporting the mediating role proposed in this study [16]. This leads to our second hypothesis (H2): USR positively influences SQ.

Furthermore, SQ is recognized as a direct predictor of SS. Several studies have confirmed that efficient and personalized services strengthen students' positive perceptions of the university experience [10], [17], [18]. Consequently, we propose our third hypothesis (H3): SQ has a positive influence on SS. Moreover, structural studies show that SQ acts as a mediating variable, channeling the positive effects of USR on SS [4], [16]. From the stakeholder salience perspective, students are definitive stakeholders whose legitimacy, power, and urgency make them central to the university's mission and strategic governance. These attributes enable students to influence institutional priorities and shape the quality of educational outcomes, positioning them as essential contributors to student success and organizational sustainability [19]. This perspective informs our mediating hypothesis (H4): SQ significantly mediates the relationship between USR and SS.

2. METHOD

2.1. Research design

This study employed a quantitative, explanatory design to examine the relationships among a set of theoretically linked variables. It employed a non-experimental, cross-sectional design, collecting data at a single point in time to assess students' perceptions of USR, SQ, and SS.

2.2. Participants

The target population consisted of undergraduate students from the third to the tenth academic cycle at five accredited universities in the Mantaro Valley, Peru. These included one public institution (Universidad Nacional del Centro del Perú) and four private universities (Universidad Continental, Universidad Peruana Los Andes, Universidad Tecnológica del Perú, and Universidad Roosevelt), ensuring representation of both governance types. The final sample comprised 505 students (63.6% female and 36.4% male) who voluntarily participated after excluding incomplete or atypical responses.

Participants represented diverse academic disciplines: 57.4% from economics, accounting, and business administration; 8.3% from systems and informatics; 8.5% from education; 12.9% from engineering; 4.2% from law; 2.2% from agronomy; 5.0% from nursing; 0.8% from medical laboratory technology; 0.6% from psychology; and 0.2% from architecture. A non-probabilistic convenience sampling technique was employed, based on student accessibility and willingness to participate. While this method limits the generalizability of the results, it is a common and appropriate approach for explanatory studies. This limitation was acknowledged in the conclusions. To ensure the validity of our results and prevent overfitting, we applied a random split-sample cross-validation procedure. A subsample of 200 cases was used for exploratory factor analysis (EFA), and the remaining 305 cases for confirmatory factor analysis (CFA) and structural model validation. Both subsamples satisfied the minimum requirement of 200 cases recommended for SEM analyses [20].

2.3. Instruments

Three 6-point Likert-type scales (1=strongly disagree to 6=strongly agree) were used to measure the model's constructs. The development and adaptation of these instruments followed the methodological guidelines proposed by [21], [22], which emphasize rigorous procedures for translation, cross-cultural adaptation, expert validation, and psychometric assessment to ensure conceptual and linguistic equivalence.

Each scale underwent a rigorous refinement process involving both EFA and CFA:

- The SS scale, adapted from Resino *et al.* [23], began with 38 items. Following CFA, the final instrument was reduced to 8 items that assess perceptions of the educational experience.
- The SQ scale initially contained 43 items. The confirmatory phase yielded a final version with 6 items, reflecting key dimensions such as curricular relevance and institutional management.
- The USR instrument was developed based on the URSULA model [24] with 55 initial items. After CFA, 12 items were retained, covering dimensions like environmental management and ethical training.

During refinement, items were excluded if they had factor loadings below 0.50 or did not contribute to convergent validity.

Construct validity was verified through exploratory and confirmatory factor analyses. EFA results showed satisfactory KMO values (SS=0.975; SQ=0.975; USR=0.967; Bartlett's test $p<0.001$) and extracted two factors for SS and SQ and four for USR, explaining 78.728%, 79.820%, and 78.353% of the variance, respectively. Reliability was confirmed through Cronbach's alpha, with coefficients above 0.90 for all constructs (SS=0.991; SQ=0.993; USR=0.991), demonstrating excellent internal consistency.

2.4. Procedure

Data collection was conducted between October and December 2023. The questionnaires were self-administered through a digital platform. Participants were informed of the objectives of the study and the confidentiality of their responses before completing the survey. Participation was voluntary and conducted in accordance with the ethical principles of social science research. As the study involved no physical or psychological risk, nor any clinical intervention, approval from an ethics committee was not required.

3. RESULTS

This section details the findings from the psychometric validation of the measurement instruments and the estimation of the structural model. The process began with an EFA on a subsample of 200 participants, followed by a CFA and the structural model estimation using the primary sample of 305 students.

3.1. Evaluation of the measurement models

The evaluation of the models was conducted through EFA, CFA, and discriminant validity analysis. In the first phase, the instruments were validated using EFA with a subsample (n=200). Before this, data adequacy was verified using the Kaiser-Meyer-Olkin (KMO) index and Bartlett's test of sphericity. The principal components extraction method with varimax rotation was then applied, considering factors with eigenvalues greater than 1 and factor loadings above 0.50. Based on the items resulting from the EFA, internal reliability coefficients were calculated using Cronbach's alpha, as shown in Table 1.

Table 1. Indicators of EFA and internal reliability

Construct	No. of items retained (EFA)	KMO	Bartlett (χ^2, gl, p)	Extracted factors	Variance explained (%)	Cronbach's alpha (α)
SS	38	0.975	$\chi^2(703)=11673, 496, p<0.001$	2	78.728	0.991
SQ	43	0.975	$\chi^2(903)=13733, 075, p<0.001$	2	79.820	0.993
USR	54	0.967	$\chi^2(1431)=15246, 775, p<0.001$	4	78.353	0.991

In the second phase of confirmatory validation, the main subsample (n=305) was used to perform the CFA and to calculate the composite reliability (CR) and average variance extracted (AVE) indicators, following the criteria established by Hair *et al.* [25]. As shown in Table 2, the CR and AVE values confirmed the convergent validity of all constructs. Discriminant validity was assessed by applying the Fornell–Larcker criterion [26], which compares the square root of the AVE of each construct (values on the diagonal) with their correlations with other constructs (values off the diagonal). For discriminant validity to be established, each square root of the AVE must be greater than its correlations with the other constructs [20], [25], [26], as shown in Table 3.

Table 2. CR and AVE of the measurement model (n=305)

Construct	No. of Items (CFA)	Cronbach's alpha	CR	AVE
SS	8	0.972	0.976	0.838
SQ	6	0.966	0.974	0.860
USR	12	0.970	0.983	0.828

Criteria: CR>0.7 and AVE>0.5 [26]

Table 3. Discriminant validity matrix according to Fornell and Larcker

Construct	SS	SQ	USR
SS	0.916*	0.804	0.712
SQ	0.804	0.927*	0.774
USR	0.712	0.774	0.910*

*the square roots of the AVE; the off-diagonal values represent the correlations among constructs. Discriminant validity is established because each square root of the AVE exceeds its respective correlations [27].

3.2. Structural model evaluation

The validation of the structural model was carried out using the maximum likelihood method, following the methodological guidelines proposed by Kline [20], with IBM AMOS v23 software. This stage aimed to estimate the overall quality of the proposed model and to verify the relevance of the structural paths established among the latent constructs: USR, SQ, and SS.

3.2.1. Global fit indices of the model

The Chi-square statistic (χ^2=147.165, df=85, p<0.001) was significant, which is common in large samples. However, the χ^2/df ratio of 1.731 indicated an excellent fit of the structural model, as it falls within the ideal range suggested by Kline [20], who recommends values below 2.0 as indicative of an excellent fit. Likewise, the incremental and absolute fit indices exceeded the suggested reference values, as shown in Table 4.

Table 4. Global fit indices of the structural model

Index	Obtained value	Reference criterion
Chi-square (χ^2)	147.165	—
Degrees of freedom (df)	85	—
χ^2/df	1.731	≤3.0
Comparative fit index (CFI)	0.989	≥0.95
Tucker-Lewis index (TLI)	0.987	≥0.95
Normed fit index (NFI)	0.975	≥0.90
Root mean square error of approximation (RMSEA)	0.049	≤0.06
P-value for close fit (PCLOSE)	0.530	≥0.05
Hoelter (0.05)	223	≥200
Hoelter (0.01)	245	≥200

Note: Criteria adapted from [20], [27], for CFI, TLI, RMSEA, χ^2/df, SRMR, PCLOSE, and Hoelter.

3.2.2. Partial adjustments and residual correlations

To improve the model fit without compromising its theoretical validity, correlations were allowed between two pairs of measurement errors: e11 with e12 (r=0.376) and e13 with e14 (r=0.362). The first correlation was justified because both items address complementary aspects of civic awareness within the framework of USR. The second correlation was explained by the halo effect, a cognitive bias whereby individuals tend to make homogeneous judgments about different attributes based on a general impression.

In this case, both items assessed institutional resources from different perspectives, but participants may have perceived them as part of the same overall evaluation. This homogeneity in responses does not imply theoretical overlap but rather a systematic pattern in perception that can be modelled statistically. As noted in previous studies [20], [28], the incorporation of correlations between errors is admissible when there is a clear conceptual justification, as in the present case.

3.2.3. Graphical representation of the structural model

Figure 1 presents the final structural equation model, which includes the standardized regression coefficients (β) that describe the magnitude and direction of the relationships among the latent constructs, as well as the factor loadings corresponding to each dimension and observed indicator. The model maintains a structure consistent with its theoretical foundation, organized in a hierarchical and multidimensional manner. The USR variable was conceptualized through two interrelated dimensions that encompass both

formative and institutional management aspects: ethical and sustainable training (EST) and socially responsible training (SRT).

The measurement of SQ was supported by the dimensions of curricular relevance and academic training (CRAT) and responsible university management (RUM), as these capture elements of the institutional experience that directly influence the perception of the service provided by the university. Meanwhile, SS was evaluated through two central dimensions: academic support and student development services (ASSDS) and academic environment and learning conditions (AELC), which integrate the overall assessment that students make regarding their educational trajectory and the university environment.

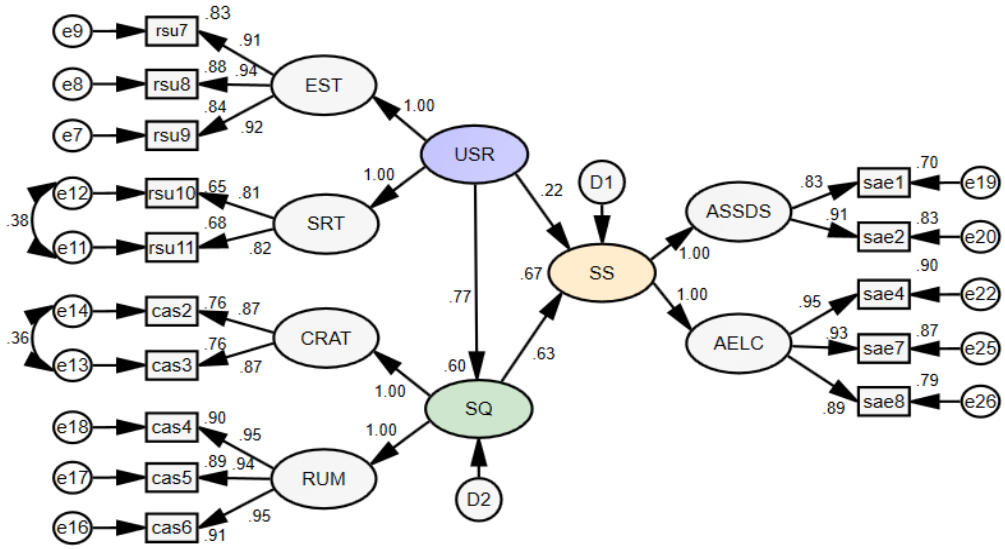

Figure 1. Structural equation model with standardized coefficients

3.2.4. Explained variance (R^2) of the endogenous constructs

The explanatory power of the model was high. The SQ variable showed a coefficient of determination of R^2=0.60, indicating that 60% of its variance was explained by USR. In turn, SS reached an R^2=0.666, which indicated that two-thirds of its variance was jointly explained by USR and SQ. These values reflect the robustness of the model and its ability to capture latent relationships of institutional relevance.

3.3. Structural model hypothesis testing

Once the quality of the model was validated, the structural paths were analyzed to test the research hypotheses. All proposed relationships were statistically significant, reinforcing the theoretical robustness of the proposed model.

- USR also exerted a direct and significant effect on SS (β=0.224, p=0.005), confirming H1.
- USR exerted a direct, positive, and significant influence on SQ (β=0.774, p<0.001), validating H2.
- SQ proved to be the strongest direct predictor of SS (β=0.630, p<0.001), supporting H3.
- Finally, the mediating role of SQ was confirmed. The analysis revealed a significant indirect effect of USR on SS through SQ (β=0.488). Since the direct effect (H1) was also significant, the data confirmed partial mediation, validating H4.

In terms of explanatory power, the model demonstrated high practical relevance. USR explained 60% of the variance in SQ (R^2=0.60), and the model explained a substantial 67% of the variance in SS (R^2=0.67). Table 5 reports the direct, indirect, and total effects estimated in the structural model. The data confirmed the hypothesized mediation, validating H4, and supported the theoretical structure of the proposed model.

Table 5. Results of direct and indirect effects of the model

Structural relationships	Direct effect	Indirect effect	Total effect
USR→SQ	0.774***	—	0.774
SQ→SS	0.630***	—	0.630
USR→SS	0.224**	0.488***	0.712

Note: p<0.001 (***), p<0.01 (**). The indirect effect of USR on SS was calculated as the product of the coefficients USR→SQ (0.774) and SQ→SS (0.630), yielding a value of 0.488. The total effect was estimated by adding the direct effect (0.224) and the indirect effect (0.488), resulting in a total value of 0.712.

4. DISCUSSION

The study analyzed the structural relationships among USR, SQ, and SS in the university context. Although the hypotheses were proposed under a reasonable framework of uncertainty, the results showed that all relationships were statistically significant, reinforcing the theoretical validity of the model. The findings empirically support the formulated hypotheses and align with previous evidence reported in the international scientific literature. First, it was confirmed that USR exerted a direct, positive, and significant effect on SS (β=0.224; p=0.005), validating H1. This finding is consistent with studies demonstrating that favorable perceptions of USR positively influence SS [3], [13]. It also aligns with the report by Suranta *et al.* [16], who from the perspective of equity theory, argues that students experience greater satisfaction when they perceive that USR actions align with principles of justice and institutional reciprocity. Previous research further suggests that a comprehensive commitment grounded in values of equity, sustainability, and citizenship strengthens students' sense of belonging and improves their overall educational experience [1], [2]. The results of this study clearly confirm that positive perceptions of USR translate directly into higher levels of SS, consolidating the relationship proposed in the initial hypothesis.

Second, it was found that USR significantly influences SQ (β=0.774; p<0.001), supporting H2. This finding is consistent with proposals indicating that USR drives transformations in institutional culture, promoting more ethical, inclusive, and student-centered management [2]. Similarly, some authors highlight that universities with socially responsible policies tend to provide higher-quality educational services, generating more inclusive and effective learning environments [4]. In line with this, dimensions associated with employability, infrastructure, and skills development-key components of USR-have been shown to positively affect students' perceptions of SQ [11].

The third finding confirmed that SQ directly impacts SS (β=0.630; p<0.001), validating H3. This relationship has been widely documented in recent studies showing that the perceived quality of academic and administrative services is a strong predictor of SS [10], [17]. The result obtained in this study underscores the importance of ensuring accessible, efficient services adapted to students' real needs. Furthermore, when applying the ECSI model in the university context, perceived quality emerged as the main antecedent of SS, reinforcing the external validity of the evaluated model [29].

Finally, a significant indirect effect of USR on SS through SQ was verified (β=0.488), confirming the partial mediation proposed in H4. This result is consistent with models that identify SQ as a key channel for transferring the benefits of USR into higher SS [4], [16]. The observed mediation also aligns with stakeholder theory, as students, identified as definitive stakeholders, directly influence the relationship between USR, SQ, and satisfaction. Their legitimacy grants them voice, their power drives responsiveness, and their urgency demand timely institutional action-factors that collectively explain the mediating role observed in the structural model [19]. It has also been highlighted that student involvement in USR initiatives enhances their perception of institutional quality, suggesting a multiplier effect on the student experience [30]. From a practical perspective, the findings reinforce the need for universities to develop comprehensive institutional USR policies as part of their continuous improvement strategies, while emphasizing the importance of investing in SQ as a critical variable for maximizing student well-being and academic loyalty. The explanatory robustness of the model (R^2=0.60 for SQ and R^2=0.67 for SS) supports its utility as a diagnostic and management tool for Latin American university environments. In this sense, structural models allow the identification of the quality dimensions with the greatest impact on satisfaction, which can guide more precise strategic decisions in emerging contexts such as Peru [14].

From a policy standpoint, these findings suggest that higher education authorities and accreditation bodies should integrate social responsibility indicators and SQ standards into institutional evaluation frameworks. Strengthening governance mechanisms that encourage universities to embed ethical education, community engagement, and environmental sustainability into their curricula can enhance both educational quality and SS. At the practical level, universities should implement continuous improvement programs that priorities efficient academic and administrative services, promote student participation in decision-making processes, and establish transparent communication channels between management and students. Such strategies can translate the principles of USR into measurable actions that foster student well-being and institutional credibility.

5. CONCLUSION

The results demonstrated that when USR is integrated as a transversal axis of institutional management-rather than treated as an isolated or complementary action-it exerts a significant influence on SQ and, both directly and indirectly, on SS. The validated structural model showed high explanatory power, accounting for 60% of the variance in SQ and 67% in SS, confirming its statistical robustness and practical relevance for understanding the student experience. Moreover, SQ was verified as a partial mediator between USR and SS, acting as a mechanism that translates institutional commitments into tangible perceptions of

quality and satisfaction. These findings highlight that social responsibility strengthens educational quality and institutional credibility through student-centered management.

Despite the statistical and theoretical robustness of the proposed model, this study has certain limitations that should be considered when interpreting the results. First, the non-experimental, cross-sectional design prevents the establishment of definitive causal relationships among USR, SQ, and SS. Second, the use of non-probability convenience sampling limits the generalizability of the findings to other university contexts. In addition, data were collected through self-reported instruments, which may introduce biases related to social desirability or respondents' subjectivity. These limitations do not invalidate the results obtained; however, they suggest caution in their extrapolation and highlight the need for future research employing longitudinal designs, probabilistic samples, and comparative approaches.

From a practical perspective, the study underscores the importance of incorporating USR as a strategic component to enhance SQ and foster SS. Future research should prioritize longitudinal designs to assess the sustainability of these relationships, test the model across diverse cultural and institutional contexts, and include emerging variables such as digital transformation, student engagement, and institutional reputation. Such approaches would expand the model's explanatory scope and provide stronger evidence for designing policies that promote sustainable, inclusive, and socially responsible higher education.

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AUTHOR CONTRIBUTIONS STATEMENT

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Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
Isac Fernando Espinoza Montes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Nérida Pilar Zevallos Cárhuaz	✓			✓		✓	✓		✓					✓
Martin Romeo Yurivilca Oscanoa		✓		✓		✓	✓		✓					✓

C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest.

INFORMED CONSENT

The study was conducted in accordance with applicable ethical standards in social research. Participation was voluntary, and informed consent was obtained from participants, ensuring anonymity and data confidentiality.

DATA AVAILABILITY

The data supporting the findings of this study are available from the corresponding author, [IFEM], upon reasonable request.

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BIOGRAPHIES OF AUTHORS

Isac Fernando Espinoza Montes is a full professor at the Faculty of Administrative Sciences, Universidad Nacional del Centro del Perú (UNCP), where he has been teaching and conducting research for more than three decades in undergraduate and graduate programs. He holds a bachelor's degree in administration, a master's degree in Administration with a specialization in Finance, and a Ph.D. in Administration. He is the author of the books Research Methodology in Administration (2022), Epistemology and Research Methodology in Administrative Sciences (2018), and Strategic Planning and Foresight (2016). His academic work is distinguished by a strong passion for teaching and fostering the development of soft skills in students, integrating these approaches with his research lines in quality, sustainability, and educational innovation. He can be contacted at email: ifespinoza@uncp.edu.pe.

Nérida Pilar Zevallos Cárhuaz is currently a Ph.D. candidate and holds a master's degree in Administration with a specialization in Finance and a bachelor's degree in Business Administration. She has a decade of experience as a university professor at the Faculty of Business Administration, where she teaches courses in administration and finance. Her solid track record in the banking sector allows her to successfully integrate professional practice into her academic teaching. Her teaching work focuses on connecting, transmitting, and transcending her students' education, fostering critical, innovative, and applicable learning. She is also committed to research and knowledge generation in finance, higher education, pedagogical innovation, and personal development, always seeking to contribute to scientific advancement and impact economic and social development. She can be contacted at email: nzevallos@uncp.edu.pe.

Martin Romeo Yurivilca Oscanoa is a university professor with extensive experience in scientific research methodology, which enables him to integrate professional practice with academic teaching. His teaching work is oriented toward connecting, transmitting, and making an impact in the training of his students, fostering critical, innovative, and practice-oriented learning. He is committed to research and knowledge generation, with a particular interest in higher education, operations management, information and communication technologies, artificial intelligence, and data analysis. His academic purpose is to conduct research that contributes to the development of society. He can be contacted at email: c30059@utp.edu.pe.