ISBN: 978-628-96613-1-6. ISSN: 2414-6390. Digital Object Identifier: https://dx.doi.org/10.18687/LACCEI2025.1.1.1058

The mediating role of satisfaction with university educational services in the formation of personal, professional, digital competences and social responsibility

Sandra Chicana-Huanca, Doctora[1], Aleixandre Duche Pérez MSc[1], Bertha Chicana-Huanca, MSc[1], María Jesús Chanamé-Domínguez, Doctora[2], Olger Gutiérrez Aguilar, Doctor[1]
[1]Universidad Católica de Santa María, Arequipa-Perú
[2]Universidad Católica San Pablo, Arequipa-Perú

schicanah@ucsm.edu.pe, aduche@ucsm.edu.pe, bertha.chicana@ucsm.edu.pe, jchaname@ucsp.edu.pe and ogutierrez@ucsm.edu.pe

***Abstract*– This research explores the mediating role of satisfaction with university educational services in developing personal, professional, digital, and social responsibility competencies in Arequipa, Peru. A multivariate model with five latent variables was used using a quantitative approach with a non-experimental cross-sectional design. Statistical processing and analysis were performed using covariance-based Structural Equation Modeling with 283 male and female students from a private university. The study results indicate that satisfaction with university educational services significantly mediates between the quality of these services and the development of personal and professional competencies, digital competencies, and social responsibility in students. The most important conclusion is that improving the quality of educational services can increase student satisfaction.**

***Keywords*— Quality of Service, Teaching, Academic Resources, digital competences, Social Responsibility.**

I. Introduction

The study of digital competencies and social responsibility has been shown to significantly impact the development of students' communication and ethical skills. Integrating digital tools significantly improves students' communication skills by fostering online communication, teamwork, and ethical information sharing [1, 2]. Đipa and Turulja also highlight the importance of curriculum quality in shaping digital competencies, especially in effective communication in digital environments [1].

In terms of ethics and social responsibility, developing digital competencies includes fostering ethical behaviours and digital citizenship, including understanding the ethical implications of digital interactions and promoting the responsible use of digital tools [2]. Curriculum-integrated social responsibility projects, such as those challenging unethical behaviour on digital networks, significantly improve students' ethical skills [3, 4].

Social responsibility can also be fostered through service-learning and social activism. Service-learning projects improve students' communication skills by encouraging them to participate in social debates and apply their skills to ethically relevant issues [4]. Furthermore, digital competencies' effectiveness in improving communication skills can be influenced by cultural and social contexts, where students from different cultural backgrounds may perceive and use digital tools differently [5].

Thus, the combination of digital competencies with social responsibility initiatives leads to a holistic development of communication and ethical skills, preparing students not only for the professional world but also fostering a sense of social responsibility and ethical behaviour [3, 6, 7].

The evolution of vocational training programs towards a competency-based approach reflects a significant change in education, highlighting the importance of developing complex skills that integrate specific technical knowledge and theoretical understanding together with ethical practices and values [8-10]. These competencies are generally classified into levels ranging from general to specific or technical skills, thus guiding the educational process to address the changing needs of the professional environment [11, 12].

Integrated models of professional competence, ranging from functional outcomes to personal or behavioural competence and reflective practice, offer a comprehensive framework for developing and assessing professional and personal competence [13]. In disciplines such as health, conceptual models distinguish between personal competence, which focuses on theoretical knowledge, and operational competence, which emphasises practical skills and critical thinking [14]. Interpersonal skills, such as empathy, emotional intelligence and effective communication, are recognised as critically important for professional success and are especially valued in professions that require direct human interaction [8, 15, 16]. These soft skills are often developed through hidden curricula and reinforced by participation in student associations and extracurricular activities [17, 18].

Developing technical and practical skills is essential in specific fields such as engineering and business administration. Professional competence in these fields includes economic and

technical knowledge and the ability to apply this knowledge effectively in real-life situations [19, 20].

Assessment models for professional competencies include item response theory and multilevel modelling, which help discern how prior training and other factors influence the development of competencies [19]. Additionally, the use of advanced technologies such as Deep SkillSetLearn (DSSL) is improving the accuracy of soft skills assessment and training, which is crucial for the proper identification and analysis of these competencies [16, 21].

This holistic approach to education, integrating technical, interpersonal, and ethical skills, is essential to preparing students not only to face the challenges of the professional world but also to foster a sense of social responsibility and ethical behaviour in an increasingly complex and digitalised society.

Quality of service (QoS) in teaching is fundamental to improving the learning experience and satisfaction of students, encompassing multiple dimensions and practices that contribute to educational quality [22-24]. Effective teaching methods and practices are crucial for student learning and satisfaction, including clarity of instruction, engagement techniques, and adaptability to student needs [22, 23, 25]. Likewise, the learning environment, which includes physical and technological facilities, plays a significant role in student satisfaction [22, 24]. A well-structured and relevant curriculum is essential to meet students' educational expectations and ensure quality education, adequately covering current industry standards [23, 24]. Fair and transparent assessment practices are equally important to assess and provide feedback on student performance, maintaining the integrity of the assessment process [25, 26].

Additional support services and facilities, such as academic counselling and extracurricular activities, enrich the overall educational experience and support the learning process [27, 28]. Measuring teaching quality through student satisfaction surveys and feedback systems allows for identifying areas for improvement and strengthening teaching practices [22, 25, 26, 28, 29].

For educators, ongoing professional development is crucial to maintaining and improving teaching quality, benefiting from training programs that integrate new pedagogical and technological strategies [30, 31]. Institutional policies should support high-quality teaching practices by providing adequate resources and fostering a positive learning environment [24, 32].

Therefore, service quality in teaching involves a multifaceted approach that includes effective teaching methods, an appropriate learning environment, a relevant curriculum, fair assessment practices, and comprehensive support services. Measuring and improving these components through student feedback and specialized models can significantly improve the educational experience and student satisfaction.

Research on academic resources and support service quality addresses multiple academic and non-academic dimensions critical to improving students' educational experiences. Studies on academic libraries have applied models such as SERVQUAL to assess their service quality, highlighting key dimensions such as reliability, responsiveness, assurance, empathy, and tangible elements [33-35]. Furthermore, assessment tools such as UTLib Qual have been developed based on the concept of tolerance zones, facilitating the collection of crucial information for strategic planning and resource allocation in libraries [36].

Studies indicate that user satisfaction is significantly influenced by the ability of libraries to meet or exceed user expectations, with results showing positive satisfaction when service quality exceeds minimum and desired levels [37]. Regarding the competencies of non-academic staff, the NONACA-SERCOM scale has highlighted the importance of their interpersonal, self-management and professional competencies to improve service quality in higher education institutions [38].

Research support structures at institutions such as the Durban University of Technology have revealed dissatisfaction among staff and postgraduate students, highlighting the need for improved performance management and service quality assessment in research offices [39]. Furthermore, the quality of research support services significantly impacts postgraduate student satisfaction, with factors such as administrative support and employability being crucial [40, 41].

Regarding general services in higher education, research consistently identifies key dimensions of service quality that are used to assess academic and non-academic services, and the perceived quality of these services has been shown to influence overall student satisfaction [40, 42]. Regarding digital and electronic services, the increasing integration of digital technologies in the provision of academic services has led to the development of models to measure the quality of these electronic services, highlighting the need for accurate measurement tools to support quality improvements [43].

Research on satisfaction with educational services has been extensive and has focused on various dimensions and factors that influence student satisfaction. Service quality is a critical dimension where access to educational services, facilities, educational environment, activities, and outcomes significantly impact student satisfaction [44]. Furthermore, a high perception of service quality enhances student satisfaction, with academic resilience as an important mediator [45]. In e-learning, factors such as efficiency, system availability, and privacy are crucial [46]. Regarding educational outcomes, satisfaction is strongly influenced by the quality of educational services, especially educational activities [44]. Teaching quality and course organization are critical in determining student satisfaction and loyalty [47]. Non-instructional services, such as administrative and physical evidence, also contribute significantly to student satisfaction and loyalty [48, 49]. Teaching methods, learning environments, and core curriculum significantly influence student satisfaction [24]. Interaction with faculty and teaching methodology are key predictors of satisfaction, especially in

post-pandemic hybrid and online systems [50]. Educational facilities and equipment are essential for student satisfaction, as is the quality of infrastructure, including technical means and library resources [51, 52].

Administrative and academic support services are vital to maintaining high levels of student satisfaction [45]. Student support activities and educational programs are also important factors [51]. Institutions should strategically focus on improving service quality in several dimensions to increase student satisfaction and loyalty [44, 47, 48]. Periodic assessments and improvements in teaching methods, infrastructure, and support services are necessary to meet changing student expectations [24, 52]. Emphasizing efficiency, system availability, and privacy in e-learning platforms can significantly increase student satisfaction [46, 53]. Based on these considerations, the following hypotheses are formulated:

Direct effects hypothesis:

H1: Quality of Service: Academic Resources and Support (QUA_ARS) -> Learning Outcomes: Digital Competences and Social Responsibility (DCSR.

H2: Quality of Service: Academic Resources and Support (QUA_ARS) -> Satisfaction (SAT).

H3: Quality of Service: Teaching (QUA_T) -> Learning Outcomes: Professional and Personal Competences (PPC).

H4: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT).

H5: Satisfaction (SAT) -> Learning Outcomes: Digital Competences and Social Responsibility (DCSR).

H6: Satisfaction (SAT) -> Learning Outcomes: Professional and Personal Competences (PPC).

Indirect effects hypothesis (Mediation)

H1: Quality of Service: Academic Resources and Support (QUA_ARS) -> Satisfaction (SAT) -> Learning Outcomes: Digital Competences and Social Responsibility (DCSR).

H2: Quality of Service: Academic Resources and Support (QUA_ARS) -> Satisfaction (SAT) -> Learning Outcomes: Professional and Personal Competences (PPC).

H3: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT) -> Learning Outcomes: Digital Competences and Social Responsibility (DCSR).

H4: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT) -> Learning Outcomes: Professional and Personal Competences (PPC).

II. Methodology

This study analyzes social media's mediating effect on students' interaction between academic performance, enjoyment, and anxiety. Using a quantitative, non-experimental, and cross-sectional approach, it seeks to contribute to the existing body of knowledge by studying how social media can influence the educational context. The relevance of this research lies in its potential to inform the design of teaching strategies that align with the diversity of learning styles and rhythms characteristic of the university student population.

The sample comprised 283 university students majoring in Advertising and Multimedia from a private university in Arequipa, Peru. With equal gender representation (56% women and 44% men), the age range was 17 to 49, with a mean of 21.20 and a standard deviation of 4.77. Data collection took place between August and December 2024. Respondents were randomly selected, and the students provided prior consent.

The instrument used is partly adapted from the research: Antecedents and consequences of student satisfaction in higher technical-vocational education: evidence from Brazil [54] and from the Teacher performance evaluation model in Covid-19 times [55].

The components of the instrument are organized on a 5-point Likert scale, where (1) Totally disagrees, (2) Disagree, (3) Neither agree nor disagree, (4) Agree, and (5) agree.

After reliability tests and exploratory and confirmatory factor analysis, the structural model was proposed with the following structure with two predictor variables: Quality of Service: Teaching (QUA_T= 5 elements) and Quality of Service: Academic Resources and Support (QUA_ARS= 6 elements) the mediation variable: Satisfaction (SAT= 5 elements), and as dependent variables: Learning Outcomes: Professional and Personal Competences (PPC= 5 elements) and Learning Outcomes: Digital Competences and Social Responsibility (DCSR= 5 elements).

III. Results

The results from Table I, obtained through SmartPLS analysis using CB-SEM (Covariance-Based Structural Equation Modeling), indicate that the estimated model provides a substantially better fit than the null model, as evidenced by several fit indices and the Chi-square statistic. The Chi-square value for the estimated model is considerably lower (833.405) than that for the null model (7419.748), indicating that the estimated model has significantly improved the fit to the data. This is further supported by the degrees of freedom, where the estimated model effectively uses more parameters (59) to capture the complexity of the data, unlike the null model, which uses only 26 parameters.

The p-value of 0.000 for the estimated model suggests that the model fit is statistically significant compared to the null model. The Chi-square per degree of freedom (ChiSqr/df) ratio for the estimated model is 2.854, which is acceptable and much better than the null model ratio of 22.830, suggesting that the estimated model is more plausible.

The estimated model's root mean square error of approximation (RMSEA) is 0.078, with a 90% confidence interval ranging from 0.072 to 0.084. This indicates a good fit, as RMSEA values less than 0.08 are generally considered to indicate a reasonable error of approximation in the population. The null model's RMSEA of 0.268 is well above this threshold, highlighting its poor fit.

Additional fit indices such as the goodness-of-fit index (GFI = 0.822), adjusted goodness-of-fit index (AGFI = 0.786), and parsimonious goodness-of-fit index (PGFI = 0.684) for the estimated model further confirm its adequacy. The standardized root mean square residual (SRMR = 0.059) is also well below the standard acceptability threshold of 0.08, suggesting a good fit of the model to the data.

The comparative fit index (CFI = 0.924), Tucker-Lewis index (TLI = 0.915), and normed fit index (NFI = 0.888) are close to or exceed the commonly accepted threshold of 0.90, further supporting the validity of the model.

In terms of model comparison, Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) values are only available for the estimated model. However, they are typically used to compare different models on the same dataset and could indicate the model's parsimony and likelihood relative to alternative models not shown here.

Overall, the analysis suggests that the estimated model provides a robust and statistically significant fit to the data, making it a valid model for understanding the underlying concepts it is intended to represent. This level of detailed assessment allows us to be confident in the model's ability to provide insight into the theoretical framework it was designed to test.

TABLE I
MODEL FIT – CB-SEM

	Estimated model	Null model
Chi-square	833.405	7.419.748
Number of model parameters	59.000	26.000
Number of observations	304.000	n/a
Degrees of freedom	292.000	325.000
P value	0.000	0.000
ChiSqr/df	2.854	22.830
RMSEA	0.078	0.268
RMSEA LOW 90% CI	0.072	0.263
RMSEA HIGH 90% CI	0.084	0.273
GFI	0.822	n/a
AGFI	0.786	n/a
PGFI	0.684	n/a
SRMR	0.059	n/a
NFI	0.888	n/a
TLI	0.915	n/a
CFI	0.924	n/a
AIC	951.405	n/a
BIC	1.170.710	n/a

In Table II, the bivariate direct effects relationships reveal how different dimensions of service quality in an educational setting directly impact student satisfaction and various learning outcomes. By further analysing these relationships, we can observe significant trends and priorities that could guide institutional improvement strategies.

Relationships between Academic Resources, Satisfaction, and Learning Outcomes: High Impact on Satisfaction (H2: coefficient = 0.588): This is the most substantial relationship observed in the table, highlighting the critical importance of academic resources and support in overall student satisfaction. Quality resources, such as access to well-equipped libraries, technological laboratories, and practical academic support, not only enrich the learning experience but also strengthen the perception of value and care from the institution. Moderate Influence on Digital Competencies and Social Responsibility (H1: coefficient = 0.406): This result suggests that the quality of academic resources affects how students feel about their educational environment and improves practical skills and critical competencies for their professional and personal development. The significant relationship indicates that improving resources could be an effective strategy to enhance specific competencies relevant in an increasingly digitalised and socially conscious world.

Teaching Quality and its Dual Impact: Strong Relationship with Professional and Personal Competencies (H3: coefficient = 0.530): Teaching quality directly and robustly impacts the development of professional and personal competencies, underscoring the importance of high-quality instruction. Trained teachers and effective teaching methods are critical to equipping students with skills to meet professional and personal challenges. Minor but Significant Impact on Satisfaction (H4: coefficient = 0.310): Although the impact on satisfaction is minor compared to academic resources, it is still an important variable. This suggests that emotional and perceptual aspects of teaching, such as personal treatment and direct support from faculty, may be key areas for interventions to improve student satisfaction. The Mediating Role of Satisfaction on Learning Outcomes: Moderate Influence on Digital Competencies and Social Responsibility (H5: coefficient = 0.340) and Professional and Personal Competencies (H6: coefficient = 0.401): These coefficients indicate that overall satisfaction with the educational experience is not only a desirable end in itself but also an effective means of improving academic performance in key areas. This could be interpreted as satisfied students being more motivated, engaged, and receptive to learning efforts, which eventually translates into better educational outcomes. This analysis proposes that educational institutions should consider integrated strategies that seek to improve individual components such as resources or teaching and promote an overall environment of student satisfaction and well-being. In doing so, they can optimise educational quality and learning outcomes, preparing students to meet academic challenges and thrive in their future careers and personal lives.

TABLE II
BI-VARIATE DIRECT-EFFECT RELATIONSHIPS

Hypothesis	Path coefficients (standardized)
H1: Quality of Service: Academic Resources and Support (QUA_ARS) -> Learning Outcomes: Digital Competences and Social Responsibility (DCSR)	0.406
H2: Quality of Service: Academic Resources and Support (QUA_ARS) -> Satisfaction (SAT)	0.588
H3: Quality of Service: Teaching (QUA_T) -> Learning Outcomes: Professional and Personal Competences (PPC)	0.530
H4: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT)	0.310

H5: Satisfaction (SAT) -> Learning Outcomes: Digital _Competences and Social Responsibility (DCSR)	0.340
H6: Satisfaction (SAT) -> Learning Outcomes: Professional and Personal Competences (PPC)	0.401

Table III describes the specific indirect effects within the model that links service quality, both in academic resources and support (QUA_ARS) and in teaching (QUA_T), with learning outcomes mediated through student satisfaction (SAT). These indirect effects allow us to understand how service quality indirectly impacts learning outcomes through student satisfaction, offering a deeper perspective on causal relationships in the educational environment. Interpretation of Indirect Effects:

H1 (Indirect Effect = 0.200): Service quality regarding academic resources and support positively affects students' digital competencies and social responsibility (DCSR) indirectly through student satisfaction. This coefficient suggests that improved resources and support can increase student satisfaction, favouring the development of digital and social competencies.

H2 (Indirect Effect = 0.236): This effect is slightly more significant than that of H1, indicating that the quality of academic resources and support has an even more significant influence on personal and professional competencies (PPC), also through satisfaction. This reflects that areas that directly impact the student experience can considerably affect their professional and personal development when they are satisfied with their academic environment.

H3 (Indirect Effect = 0.105): Teaching quality influences digital competencies and social responsibility through student satisfaction, although with a minor impact compared to resources and support. This could indicate that, while quality teaching is essential, its effect on specific digital and social learning outcomes through satisfaction is not as strong as that of academic resources.

H4 (Indirect Effect = 0.124): Similar to H3, teaching quality impacts personal and professional competencies through satisfaction. This coefficient is higher than that of H3, suggesting that teaching more effectively influences the development of professional and personal skills through satisfaction compared to digital and social skills.

These indirect effects emphasize the importance of student satisfaction as a critical mediator between educational service quality and learning outcomes. Satisfaction is a desirable outcome and a key facilitator of the practical application of acquired competencies. In the context of the research, these results suggest that interventions seeking to improve the quality of resources and teaching should consider how these improvements foster student satisfaction, as this directly impacts how students apply and develop competencies in the long term.

These findings could guide educational institutions to focus their strategies not only on the direct improvement of infrastructure and teaching quality but also on creating an environment that promotes overall student satisfaction, which translates into more effective learning and better-developed competencies.

TABLE III
SPECIFIC INDIRECT EFFECTS

Hypothesis	Path coefficients (standardized)
H1: Quality of Service: Academic Resources _and Support (QUA_ARS) -> Satisfaction (SAT) -> Learning Outcomes: Digital _Competences and Social Responsibility (DCSR)	0.200
H2: Quality of Service: Academic Resources _and Support (QUA_ARS) -> Satisfaction (SAT) -> Learning Outcomes: Professional _and Personal Competences (PPC)	0.236
H3: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT) -> Learning Outcomes: Digital _Competences and Social Responsibility (DCSR)	0.105
H4: Quality of Service: Teaching (QUA_T) -> Satisfaction (SAT) -> Learning Outcomes: Professional _and Personal Competences (PPC)	0.124

Table IV shows the Heterotrait-Monotrait (HTMT) ratio values for assessing discriminant validity between various constructs in a study. HTMT values compare the magnitude of correlations between indicators of different constructs with the correlations between indicators of the same construct, with a standard threshold of acceptability being less than 0.85 to confirm discriminant validity.

DCSR and PPC (0.863): This value is very close to the critical threshold of 0.85, suggesting that, although there is sufficient discrimination according to the conservative standard, the distinction between digital and social competencies (DCSR) and professional and personal competencies (PPC) might not be as clear. This could indicate an overlap in how these constructs are perceived or measured.

DCSR, QUA_ARS (0.679), QUA_T (0.665), and SAT (0.674): These values are well below the threshold of 0.85, indicating good discrimination between the DCSR constructs and those of academic resources and support (QUA_ARS), teaching quality (QUA_T), and satisfaction (SAT). This confirms that these variables represent distinct phenomena and are adequately differentiated.

PPC with QUA_ARS (0.827), QUA_T (0.843), and SAT (0.825): These values, although below the threshold, are close to it, especially in the case of PPC and QUA_T. This could reflect a relatively high association between the perception of teaching quality and the development of professional and personal competencies, which is plausible given that teaching directly impacts the development of competencies.

QUA_ARS and QUA_T (0.897): This value is above the 0.85 threshold, indicating a lack of adequate discrimination between the constructs of academic resources and support and teaching quality. This result suggests that respondents may not differentiate between these two aspects of academic service quality.

SAT with QUA_ARS (0.866) and QUA_T (0.852): Both values are just above the 0.85 threshold, suggesting that student satisfaction is highly linked to both the quality of academic

resources and support and the quality of teaching. This may indicate that students perceive these factors similarly regarding their overall satisfaction.

TABLE IV
HETEROTRAIT CRITERION - MONOTRAIT –HTMT

	DCSR	PPC	QUA_ARS	QUA_T	SAT
DCSR					
PPC	0.863				
QUA_ARS	0.679	0.827			
QUA_T	0.665	0.843	0.897		
SAT	0.674	0.825	0.866	0.852	

Figure 1 illustrates a structural model that examines the relationships between service quality (both teaching and resources and support), satisfaction, and learning outcomes in professional and personal competencies, as well as digital competencies and social responsibility. This analysis focuses on the coefficients of determination (R^2) to understand the variability in the dependent variables explained by the independent variables in the model. Below is the analysis of the Coefficients of Determination (R^2):

Satisfaction (SAT) - $R^2 = 0.781$: This high value indicates that the variables in the model explain approximately 78.1% of the variability in student satisfaction. This robust result underlines the significant influence that service quality, both in teaching and resources and support, has on student satisfaction. Satisfaction acts as a key mediator between service quality and learning outcomes.

Learning Outcomes in Professional and Personal Competencies (PPC)—$R^2 = 0.401$: The model explains 40.1% of the variability in learning outcomes related to professional and personal competencies. Although significant, this value suggests that other factors besides satisfaction and service quality influence these competencies.

Learning Outcomes in Digital Competencies and Social Responsibility (DCSR)—$R^2 = 0.523$: The model variables explain 52.3% of the variability in learning outcomes in digital competencies and social responsibility. This indicates that satisfaction, along with the quality of resources and support, considerably impacts these learning areas.

Impact of Service Quality: The paths from service quality in teaching (QUA_T) and resources and support (QUA_ARS) to satisfaction and from satisfaction to learning outcomes demonstrate the importance of these services in students' educational experiences. Interventions to improve these areas could significantly affect satisfaction and, consequently, learning outcomes.

Mediating Roles of Satisfaction: Satisfaction is a potent mediator in the model, connecting service quality to learning outcomes. This suggests that students' perceptions of service quality directly influence how they feel about their education, impacting their learning outcomes.

Need to Explore Other Factors: Although the R^2 values for learning outcomes are significant, they are not exhaustive, indicating the need to investigate other possible factors that may also influence these outcomes, such as family environment, personal motivations, and socioeconomic conditions.

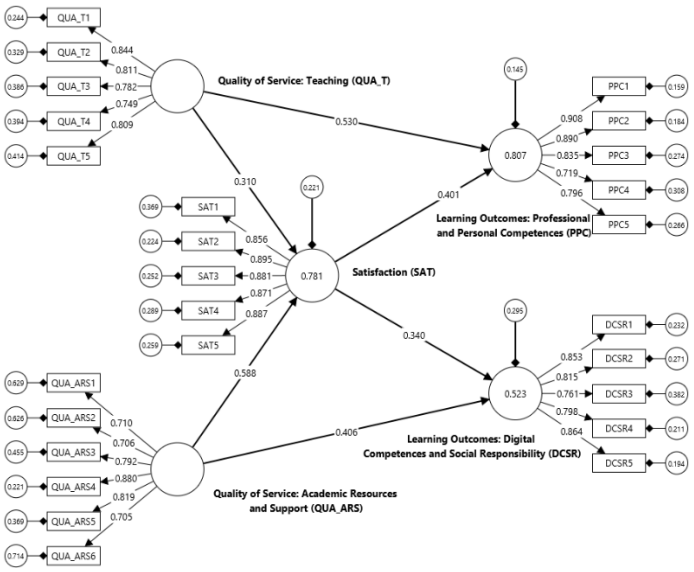

Figure 1 Results of the structural explanatory model.

IV. DISCUSSION AND CONCLUSIONS

The discussion of the results obtained in this study illustrates the complex interaction between educational service quality and student satisfaction and how this relationship affects learning outcomes. The significantly superior fit of the estimated model compared to the null model, evidenced by improvements in the Chi-square and other indices such as the RMSEA and CFI, confirms the adequacy of the structural model to assess these interactions [44, 48]. These results underline the model's validity in explaining how the perception of the quality of educational services directly influences student satisfaction and, in turn, their educational outcomes.

The role of student satisfaction as a mediator between service quality and learning outcomes is particularly revealing. This finding aligns with the literature suggesting that student satisfaction is not only a desirable outcome but also a critical factor that enhances educational outcomes [45, 47]. In this study, satisfaction acts as a bridge between services received and perceived educational benefits, implying that improvements in service quality can lead to increased satisfaction, which improves learning outcomes. This highlights the importance of institutional efforts to improve the quality of resources and teaching, as these changes can have an amplified impact through improved student satisfaction.

However, the proximity of some HTMT values to the threshold of 0.85 suggests that students' perceptions of different aspects of the educational service may not be as differentiated as they should be [40]. This raises concerns about how quality and satisfaction constructs are defined and measured, suggesting the need for more transparent and precise methods

to ensure that these measures reflect meaningful and fundamental differences. Therefore, to maximize the effectiveness of educational interventions, institutions must focus on improving specific aspects of the service and how these improvements are evaluated and perceived, ensuring that policies and practices foster an actual improvement in the student experience. Therefore, the study underlines the crucial role of satisfaction as a mediator in the educational service quality model and emphasizes the need to address both direct quality improvement and its adequate perception to optimize educational outcomes.

The detailed analysis of the direct and indirect effects on the relationship between service quality, student satisfaction and learning outcomes suggests that improving educational service quality can increase student satisfaction, enhancing their academic outcomes. This finding is crucial for educational institutions seeking to optimize their educational offerings. Improvement strategies should focus not only on the infrastructure and resources available but also on how these resources are perceived and the satisfaction they generate among students. This cyclical relationship between resources, quality perception, satisfaction and learning outcomes underlines the need for a holistic and well-integrated approach to managing educational services.

Finally, validating the discrimination between constructs through the HTMT values indicates that, while most constructs are differentiated, some indicate an overlap that might require a review of the definition and measurement of these elements. Institutions should pay attention to how they define and evaluate the components of their educational service to ensure that the implemented improvements reflect and respond to their students' real needs and perceptions. This approach will not only improve the quality of the educational service offered. However, it will also strengthen the relationship between student satisfaction and learning outcomes, supporting students' long-term academic and personal success.

REFERENCES

[1] A. Đipa and L. Turulja, "The Role of Higher Education Curriculum Quality in Fostering Digital Skills of University Students," in *Communications in Computer and Information Science*, 2023, vol. 1916 CCIS, pp. 1-21.

[2] K. Martzoukou, P. Kostagiolas, C. Lavranos, T. Lauterbach, and C. Fulton, "A study of university law students' self-perceived digital competences," *Journal of Librarianship and Information Science,* Article vol. 54, no. 4, pp. 751-769, 2022, doi: 10.1177/09610006211048004.

[3] M. V. Contreras and J. M. Maluenda-Albornoz, "Methodological adjustments in a computer engineering course to enhance social responsability," in *Proceedings - International Conference of the Chilean Computer Science Society, SCCC*, 2017, vol. 2017-October, pp. 1-4, doi: 10.1109/SCCC.2017.8405115.

[4] O. Kolotouchkina, J. E. Gonzálvez Vallés, and M. D. H. Alonso Mosquera, "Fostering Key Professional Skills and Social Activism Through Experiential Learning Projects in Communication and Advertising Education," *Journalism and Mass Communication Educator,* Article vol. 76, no. 1, pp. 46-64, 2021, doi: 10.1177/1077695820919633.

[5] G. C. Zilka and R. Cohen, "The digital literacy of students belonging to different sectors and studying on multicultural campuses," *Israel Affairs,* Article vol. 28, no. 2, pp. 297-315, 2022, doi: 10.1080/13537121.2022.2041828.

[6] J. Holguin-Alvarez *et al.*, "Digital Competences in the Elderly and University Students: Didactic Interaction from the Use of Social Networks," *International Journal of Emerging Technologies in Learning,* Article vol. 16, no. 4, pp. 188-200, 2021, doi: 10.3991/ijet.v16i04.18519.

[7] M. Á. S. M. Miguel and F. S. Pelegrí, "Freedom in the new educational environments: Technological Competence and Comprehensive Education," *Quien,* Article vol. 2022, no. 15, pp. 113-135, 2022.

[8] J. P. McNulty and Y. Politis, "Empathy, emotional intelligence and interprofessional skills in healthcare education," *Journal of Medical Imaging and Radiation Sciences,* Article vol. 54, no. 2, pp. 238-246, 2023, doi: 10.1016/j.jmir.2023.02.014.

[9] K. Saldanha and D. M. Ragg, "Using Flipped-Course Pedagogy to Promote Competence in Professional Education," in *Evidence-Based Education in the Classroom: Examples From Clinical Disciplines*, 2024, pp. 47-57.

[10] R. M. Taylor, "Defining, constructing and assessing learning outcomes," *OIE Revue Scientifique et Technique,* Article vol. 28, no. 2, pp. 779-788, 2009, doi: 10.20506/rst.28.2.1923.

[11] C. G. Bienzobas and A. V. Barderas, "Professional competences," *Educacion Quimica,* Article vol. 21, no. 1, pp. 28-32, 2010, doi: 10.1016/S0187-893X(18)30069-7.

[12] C. Gonzalez-Martinez, C. L. M. Silva, and R. Costa, "PhD competences in food studies," *International Journal of Food Studies,* Article vol. 3, no. 2, pp. 136-144, 2014, doi: 10.7455/ijfs/3.2.2014.a1.

[13] G. Cheetham and G. Chivers, "Professional competence: Harmonizing reflective practitioner and competence-based approaches," in *Developing the Capable Practitioner: Professional Capability Through Higher Education*, 2013, pp. 215-228.

[14] L. Grealish, "Learning to be a professional: Two models of competence and related learning strategies," *Journal of Religion, Spirituality and Aging,* Article vol. 18, no. 4, pp. 207-225, 2006, doi: 10.1300/J496v18n04_02.

[15] F. A. Halim, N. A. Muhammad, and W. H. Nadrah Binti Wan Muda, "Factors Predicting the Acquisition of Soft Skills among Students with Learning Disabilities in Vocational Special Education Secondary School," in *9th International STEM Education Conference, iSTEM-Ed 2024 - Proceedings*, 2024, doi: 10.1109/iSTEM-Ed62750.2024.10663189.

[16] K. A. Saira Banu and T. R. Kalai Lakshmi, "DSSL: A Comprehensive Analysis of Optimizing Professional Competence through Deep SkillSetLearn Model for Soft Skills Training," in *7th International Conference on Inventive Computation Technologies, ICICT 2024*, 2024, pp. 118-124, doi: 10.1109/ICICT60155.2024.10544514.

[17] J. Lopukhova, E. Makeeva, E. Gorlova, and T. Rudneva, "Student Associations as a Way of Improving Professional Competencies and Soft Skills," in *Lecture Notes in Networks and Systems*, 2023, vol. 634 LNNS, pp. 455-464, doi: 10.1007/978-3-031-26190-9_47.

[18] V. Vijayalakshmi, "Soft skills-the need of the hour for professional competence: A review on interpersonal skills and intrapersonal skills theories," *International Journal of Applied Engineering Research,* Review vol. 11, no. 4, pp. 2859-2894, 2016.

[19] M. Förster, S. Brückner, and O. Zlatkin-Troitschanskaia, "Assessing the financial knowledge of university students in Germany," *Empirical Research in Vocational Education and Training,* Article vol. 7, no. 1, pp. 1-20, 2015, doi: 10.1186/s40461-015-0017-5.

[20] A. Shekh-Abed and N. Barakat, "Associations between components of systems thinking and soft skills among engineering students," *Global Journal of Engineering Education,* Article vol. 26, no. 3, pp. 155-160, 2024.

[21] N. Y. Fedorova and E. N. Nikiforova, "Law Students' Professional Competences Assessment Model in the Context of Digitalization of Education and Workplace," in *Proceedings - 2024 4th International Conference on Technology Enhanced Learning in Higher Education, TELE 2024*, 2024, pp. 148-152, doi: 10.1109/TELE62556.2024.10605645.

[22] H. Ö. Beydoğan, "Satisfaction Level of Faculty of Education Students with the Service Quality of Teaching," *Turkish Online Journal of Educational Technology,* Article vol. 2017, no. November Special Issue INTE, pp. 877-889, 2017.

[23] R. Rasheed and A. Rashid, "Role of service quality factors in word of mouth through student satisfaction," *Kybernetes,* Article vol. 53, no. 9, pp. 2854-2870, 2024, doi: 10.1108/K-01-2023-0119.

[24] V. S. S. R. Muramallaa and H. A. Alqahtanib, "Quality of services and the impact on students' satisfaction in universities," *International Journal of Innovation, Creativity and Change,* Article vol. 7, no. 7, pp. 335-350, 2019.
[25] H. S. Lukman, A. Setiani, and N. Muhassanah, "Structural equation modelling of teaching quality on students' satisfaction," in *Journal of Physics: Conference Series*, 2020, vol. 1657, 1 ed., doi: 10.1088/1742-6596/1657/1/012083.
[26] R. K. F. Ip, S. I. F. Iong, M. X. Y. Wu, and S. S. Y. Wang, "A preliminary study on teaching quality assessment from the perspective of 'students as customers '," in *Proceedings of 2017 IEEE International Conference on Teaching, Assessment and Learning for Engineering, TALE 2017*, 2017, vol. 2018-January, pp. 444-448, doi: 10.1109/TALE.2017.8252376.
[27] L. Pham, Y. B. Limbu, T. K. Bui, H. T. Nguyen, and H. T. Pham, "Does e-learning service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam," *International Journal of Educational Technology in Higher Education,* Article vol. 16, no. 1, 2019, Art no. 7, doi: 10.1186/s41239-019-0136-3.
[28] A. Athanasiadis, V. Papadopoulou, and K. Kasimatis, "Measuring Service Quality in Teacher Training Programs: The EppekQual Scale," *Educational Administration: Theory and Practice,* Article vol. 29, no. 2, pp. 48-68, 2023.
[29] M. Mangia, V. Mehta, C. R. Pathak, and S. N. Mohanty, "Students' feedback- An effective tool towards enhancing the Teaching Learning Process," *EAI Endorsed Transactions on Scalable Information Systems,* Article vol. 10, no. 5, pp. 1-10, 2023, doi: 10.4108/eetsis.3347.
[30] L. Wang, "Research on Strategies to Improve Service Quality of College Teacher Development Center in the Age of "internet +"," in *Journal of Physics: Conference Series*, 2020, vol. 1437, 1 ed., doi: 10.1088/1742-6596/1437/1/012036.
[31] S. L. Knight and R. A. Duschl, "Current trends in the framing of teacher qualities," *International Perspectives on Education and Society,* Article vol. 27, pp. 443-465, 2015, doi: 10.1108/S1479-367920140000027012.
[32] P. Roberts and H. Priest, "Education: improving quality through service enhancement," *Nursing standard (Royal College of Nursing (Great Britain) : 1987),* Article vol. 21, no. 18, pp. 42-46, 2007, doi: 10.7748/ns.21.18.42.s49.
[33] K. J. Saadoon, M. Muhlis, and R. O. Mohammed, "Architecture Students' Satisfaction in Iraqi Private Universities: TIU-S in Focus," *International Journal of Sustainable Development and Planning,* Article vol. 17, no. 4, pp. 1349-1354, 2022, doi: 10.18280/ijsdp.170432.
[34] P. Mbua, "Applying Service Quality Theoretical Framework for Quality Service Delivery in Academic Libraries from an African Library Perspective," in *Synthesis Lectures on Information Concepts, Retrieval, and Services*, vol. Part F3363, 2025, pp. 109-130.
[35] M. J. Hossain, "Determining the Key Dimensions for Evaluating Service Quality and Satisfaction in Academic Libraries," *International Information and Library Review,* Article vol. 48, no. 3, pp. 176-189, 2016, doi: 10.1080/10572317.2016.1205350.
[36] O. Einasto, "Using service quality monitoring to support library management decisions: A case study from Estonia," *International Information and Library Review,* Article vol. 41, no. 1, pp. 12-20, 2009, doi: 10.1080/10572317.2009.10762793.
[37] S. M. Dahan, M. Y. Taib, N. M. Zainudin, and F. Ismail, "Surveying Users' Perception of Academic Library Services Quality: A Case Study in Universiti Malaysia Pahang (UMP) Library," *Journal of Academic Librarianship,* Article vol. 42, no. 1, pp. 38-43, 2016, doi: 10.1016/j.acalib.2015.10.006.
[38] P. T. Nga, A. Shamim, and R. Salleh, "Developing and validating a scale for non-academic staff's service competencies in higher education," *Cogent Education,* Article vol. 12, no. 1, 2025, Art no. 2450127, doi: 10.1080/2331186X.2025.2450127.
[39] M. Ngibe and L. M. Lekhanya, "Perceptions of research structures and service quality within various faculties at Durban University of Technology: Staff and students perspective," *Problems and Perspectives in Management,* Article vol. 14, no. 1, pp. 192-200, 2016, doi: 10.21511/ppm.14(1-1).2016.07.
[40] L. K. Pitaloka and B. B. Hapsoro, "Analyzing universities service quality to student satisfaction; academic and non-academic analyses," *International Journal of Higher Education,* Article vol. 19, no. 1, pp. 126-132, 2020, doi: 10.5430/ijhe.v9n1p126.
[41] R. Ganesh and A. Haslinda, "Evaluation of students' satisfaction with perceived performance value projection in Malaysian private higher education institutions," *International Journal of Services, Economics and Management,* Article vol. 10, no. 3, pp. 266-287, 2019, doi: 10.1504/IJSEM.2019.103183.
[42] W. J. A. Putra, "The measurement of students at is faction on three aspects of higher education services (Studyat Post-Graduate Study Program in State University of Malang)," *International Journal of Applied Business and Economic Research,* Article vol. 14, no. 6, pp. 4867-4885, 2016.
[43] T. Lupo and E. Buscarino, "A methodological approach for developing and validating a parsimonious and robust measurement tool: The academic e-service quality (acequal) model," *Education Sciences,* Article vol. 11, no. 10, 2021, Art no. 613, doi: 10.3390/educsci11100613.
[44] H. V. T. Dinh, Q. A. T. Nguyen, M. H. T. Phan, K. T. Pham, T. Nguyen, and H. T. Nguyen, "Vietnamese students' satisfaction toward higher education service: The relationship between education service quality and educational outcomes," *European Journal of Educational Research,* Article vol. 10, no. 3, pp. 1397-1410, 2021, doi: 10.12973/EU-JER.10.3.1397.
[45] G. K. Amoako, G. O. Ampong, A. Y. B. Gabrah, F. de Heer, and A. Antwi-Adjei, "Service quality affecting student satisfaction in higher education institutions in Ghana," *Cogent Education,* Article vol. 10, no. 2, 2023, Art no. 2238468, doi: 10.1080/2331186X.2023.2238468.
[46] M. Munawaroh and U. Chasanah, "The Quality of E-Learning Services and Its Role in Elevating Student Satisfaction: Is There a Gender Difference?," in *Lecture Notes in Networks and Systems*, 2024, vol. 1080 LNNS, pp. 426-438, doi: 10.1007/978-3-031-67444-0_41.
[47] L. Masserini, M. Bini, and M. Pratesi, "Do Quality of Services and Institutional Image Impact Students' Satisfaction and Loyalty in Higher Education?," *Social Indicators Research,* Article vol. 146, no. 1-2, pp. 91-115, 2019, doi: 10.1007/s11205-018-1927-y.
[48] I. Amoako, E. Anane, and A. Cobinnah, "Mediating effect of hardiness in the nexus of service quality and students' satisfaction of public universities in Ghana," *Cogent Education,* Article vol. 10, no. 2, 2023, Art no. 2276273, doi: 10.1080/2331186X.2023.2276273.
[49] A. K. Paswan and G. Ganesh, "Higher education institutions: Satisfaction and loyalty among international students," *Journal of Marketing for Higher Education,* Article vol. 19, no. 1, pp. 65-84, 2009, doi: 10.1080/08841240902904869.
[50] O. Gutierrez-Aguilar, A. Gutierrez-Aguilar, and S. Chicana-Huanca, "Level of satisfaction of hybrid and online educational systems in university students during Post-Pandemic times," in *Iberian Conference on Information Systems and Technologies, CISTI*, 2023, vol. 2023-June, doi: 10.23919/CISTI58278.2023.10211367.
[51] N. C. Hai, "Factors Affecting Student Satisfaction with Higher Education Service Quality in Vietnam," *European Journal of Educational Research,* Article vol. 11, no. 1, pp. 339-351, 2022, doi: 10.12973/EU-JER.11.1.339.
[52] D. V. Maltsev and D. S. Repetskiy, "Satisfaction of students with the quality of educational services at technical university," *Vysshee Obrazovanie v Rossii,* Article vol. 29, no. 5, pp. 45-52, 2020, doi: 10.31992/0869-3617-2020-29-5-45-52.
[53] Y. Lu and M. S. Khan, "Influence of higher education e-service quality on e-learning student satisfaction; as moderated by digital literacy: a mixed method research approach," *Revista de Gestao Social e Ambiental,* Article vol. 18, no. 1, 2024, Art no. e06077, doi: 10.24857/rgsa.v18n1-112.
[54] J. H. de Oliveira Silva, G. H. de Sousa Mendes, G. M. D. Ganga, R. C. Mergulhão, and F. L. Lizarelli, "Antecedents and consequents of student satisfaction in higher technical-vocational education: evidence from Brazil," *International Journal for Educational and Vocational Guidance,* vol. 20, no. 2, pp. 351-373, 2020/07/01 2020, doi: 10.1007/s10775-019-09407-1.
[55] O. G. Aguilar, A. B. D. Pérez, and A. G. Aguilar, "Teacher performance evaluation model in Covid-19 times," in *2020 XV Conferencia Latinoamericana de Tecnologias de Aprendizaje (LACLO)*, 19-23 Oct. 2020 2020, pp. 1-6, doi: 10.1109/LACLO50806.2020.9381159.