



OPEN ACCESS

EDITED BY

Víctor Hugo Fernández-Bedoya,
Universidad Nacional Mayor de San Marcos,
Peru

REVIEWED BY

Abna Hidayati,
Padang State University, Indonesia
Fernanda Da Silva Momo,
Federal University of Rio Grande do Sul
(UFRGS), Brazil

*CORRESPONDENCE

Jorge Jinchuñá Huallpa
✉ jjinchunah@unam.edu.pe

RECEIVED 01 September 2025

ACCEPTED 15 October 2025

PUBLISHED 31 October 2025

CITATION

Mayta Huiza DA, Jinchuñá Huallpa J, Chambi
Palero A, Flores Arocutipá JP and Luján
Minaya JC (2025) Administrative
decentralization policies and developments in
educational quality management in Peru.
Front. Educ. 10:1694697.
doi: 10.3389/feduc.2025.1694697

COPYRIGHT

© 2025 Mayta Huiza, Jinchuñá Huallpa,
Chambi Palero, Flores Arocutipá and
Luján Minaya. This is an open-access article
distributed under the terms of the [Creative
Commons Attribution License \(CC BY\)](#). The
use, distribution or reproduction in other
forums is permitted, provided the original
author(s) and the copyright owner(s) are
credited and that the original publication in
this journal is cited, in accordance with
accepted academic practice. No use,
distribution or reproduction is permitted
which does not comply with these terms.

Administrative decentralization policies and developments in educational quality management in Peru

Dora Amalia Mayta Huiza¹, Jorge Jinchuñá Huallpa^{2*},
Asunción Chambi Palero¹, Javier Pedro Flores Arocutipá² and
Julio César Luján Minaya³

¹Universidad José Carlos Mariategui, Moquegua, Peru, ²Universidad Nacional de Moquegua, Perane, Peru, ³Universidad Nacional de Cañete, San Vicente de Cañete, Peru

The objective of the research was to determine the relationship between decentralized policies, techniques, and human resources directly related to improving educational quality and the influence of supervisory actions and information and communication technologies in the Local Educational Management Unit of Puno, Peru, 2023. It is quantitative in approach, non-experimental in design, and causal explanatory, with a sample of 203 collaborators who were given a questionnaire. The analysis was performed using SEM-PLS. The findings reveal that the implementation of administrative management decentralization policies is still too weak to achieve educational quality ($R^2 = 0.034$), while the impact of the mediating variables of supervision and the use of information and communication technologies is very significant and strong ($f^2 > 0.35$) in the direct relationship between decentralized management policies and educational quality management. It is concluded that ongoing supervision and the implementation of information and communication technologies are important for improving educational quality management and administrative activities.

KEYWORDS

policies, decentralization, educational quality, supervision, Peru

1 Introduction

The National Education Council of Peru and UNESCO are conducting the first evaluation of public policies implemented in Peru to improve the quality of education in the country. This document presents an assessment of all such policies, including those related to decentralized education management, which have been mandatory state policies for the past 15 years. The education process has faced numerous challenges due to the limited capacity of regional governments. In contrast, greater progress has been achieved at the central government level as a result of regulatory measures and initiatives aimed at strengthening the government's presence and support for regional and local levels (UNESCO National Education Council, 2017). To strengthen the presence and attention to the regions and local levels (UNESCO National Education Council, 2017).

The Ministry of Education (2015) collects important statistical information on education in the San Martín region. From 2004 to 2013, public spending on education was 9% at the early childhood level, 11% at the primary level, and 11% at the secondary level. During these years, these indicators were lower than the national indicators, and the gap widened at the early childhood level despite the policy's implementation aimed at improving access to early childhood education. In terms of infrastructure, educational institutions at all three levels have

the three basic services: drinking water, sewage, and electricity. The attendance indicators at the early childhood and secondary levels increased from 70.10 to 77.30%, while at the primary level, it fluctuated at 93%. The student-teacher ratios are 21, 19, and 13 in early childhood, primary, and secondary education, respectively, which are higher than the national average. The indicators for backwardness and failure are higher than the national average, at 3.4 and 5.5%, respectively, compared to 1.7 and 3.6% nationally. The planning process enables the identification and analysis of the institution's weaknesses and opportunities, with a focus on positive learning experiences that impact pedagogical management. It emphasizes proactive and innovative leadership and teamwork to achieve the expected learning outcomes (Geldrech, 2019; Torres, 2014).

The educational management policy guidelines adopted in 2001 were implemented due to the deterioration of education in Peru. The diagnosis confirms the need to strengthen and initiate a process of decentralizing educational management (Consejo Nacional de Educación, 2007). Furthermore, Ministerial Resolution 168-2002-ED recognized that profound changes in educational quality and equity were only feasible if a decentralized education system was implemented. Therefore, Peruvian educational management in the 21st century considers the requirement to achieve quality education with equity, using ethics as an imperative to reduce social differences, and the need to include citizen participation in educational management, such as closely related interest groups, such as parents and local authorities, which will drive the transformation of educational management. Thus, the factors established for quality educational management are equity, quality, ethics, relevance, participation, and decentralization. In this environment, MINEDU developed many regulations aimed at improving educational quality with equity, as specified in General Education Law 28044 (2003).

Subsequently, the National Education Project (PEN) 2006 was developed, establishing policy guidelines for improving educational quality. In addition, Supreme Decree 078-2006 PCM authorizes the municipalization of educational management, among other things. However, very limited action has been taken on this latter regulation. The 2003 assessment of the education sector reported achievements in expanding enrollment, known as school access coverage, to 96% at the primary level and 86% at the secondary level, which meant greater democratization of Peruvian education. However, differences remain in access coverage between boys and girls, in public and private schools, in urban and rural public educational institutions, and in the Lima region and the interior of the country.

Decentralization began with the implementation of 26 Regional Education Directorates (DRE), one for each regional government in the country. Subsequently, 218 Educational Management Units (UGEL) were created. These are decentralized organizational units that manage the pedagogical, administrative, and financial activities that are essential for providing quality educational services. Since 2013, the Ministry of Education (MINEDU) has been promoting the modernization of some UGELs as part of the public management modernization framework. However, the inequality in the size of these institutions in terms of the number of regular basic education (EBR) institutions and the number of students they administer still represents a significant problem to be overcome, as do their structures, the implementation of technology for timely information and communication, and the lack of spaces to optimize the monitoring and supervision of the DREs.

The Regional Directorate of Education of Puno (DREP) publishes the institutional strategic plan document called the 2017–2025 Regional Concerted Education Plan (PERC), which considers the policies of educational decentralization in Peru, leaving the DREP as the governing body. It must intervene with permanent monitoring of the management of the 14 UGELs implemented, which will take on the challenge of their development and achievement of educational objectives and goals in order to improve the quality of educational institutions in Regular Basic Education (EBR) and non-university higher education in the Puno region. The 2022 Institutional Operational Plan (POI) indicates that UGELPuno was implemented in 2002 with a Staff Allocation Table (CAP) of 56 employees, including managers, administrative staff, and technicians, located in the provincial capital and district of Puno, with the functions established in the Framework Law on Decentralization and its amendments, as well as in the General Education Law.

According to the 2020 School Census, there are 6,988 students enrolled in early childhood education, 15,361 in primary education, and 12,358 in secondary education. A total of 2,331 EBR teachers are located in 311 educational institutions. The Puno region, UGEL-Puno, has the largest number of students, educational institutions, and teachers. It has an organizational structure established in the ROF and MOF, where the educational management and operation units, along with the administrative management and direction units, are implemented. Among its critical issues, they indicate that the decentralized educational management officials of UGEL-Puno and the directors of the educational institutions in their area have limited support in implementing regulatory management documents. Additionally, they have limited information related to the competencies proposed in the framework of good management performance. The UGEL-Puno transparency portal does not contain the semi-annual management evaluation documents required by the regulations and the resolution approving the UGEL-Puno POI 2022.

The DREP evaluation documents are scarce; there are only two annual POI evaluations for 2020, 2022, and 2023. Similarly, there are no evaluations of the progress of the 2017–2025 POI. The information in the POI evaluations is very scarce, primarily showing the number of activities achieved and budget amounts executed, but no information is provided on management goals and objectives, activities, and projects to improve educational quality, especially BR education programs. The POI 2023 document identifies strengths and weaknesses, the most important of which are weak coordination between offices and SIC, low levels of human resources training, budgetary resources that do not allow for the fulfillment of operational activities, and an incomplete CAP, resulting in insufficient management and monitoring actions and inadequate human talent management.

With the limited information in the diagnosis carried out in the management documents and comparing it with national problems in administrative, technical, and human management policies in the UGEL during the process of educational decentralization, which are similar in terms of heterogeneity regarding the number of IE-EBR and students, limited human resource capacities, and insufficient supervision and monitoring actions by the DRE, among other factors, the concerns of key stakeholders such as teachers and UGEL-Puno administrators regarding latent problems in the management of the DREP and UGEL-Puno are confirmed. These problems have been limiting improvements in the educational quality of EBR and non-university higher education institutions.

Business management is highly competitive, involving constant innovation, technological changes, and continuous improvement tools, all of which come with latent risks that must be controlled. This is why implementing an internal control system is essential in organizations, as it ensures the effective and efficient management of operations, the reliability of financial and economic information, and compliance with legal regulations. An ICS has five components, one of which is supervision and monitoring (Vega and Nieves, 2016), defined as a policy tool established in the first component of the control environment. These two components represent the continuous improvement approach because continuous and periodic evaluation, monitoring, and supervision are responsible for achieving the effectiveness and efficiency of internal control in follow-up activities. Similarly, effective supervision activities identify whether those carried out in a process are being executed in accordance with the planned actions toward other levels or processes while monitoring (Vega and Nieves, 2016; Del Río, 2009) includes supervision activities carried out directly by different management structures in the organization, preventing events that generate errors, omissions, losses, or costly activities (Inca, 2019; Mejía and Torres, 2020).

For public entities, the Internal Control Law (Law No. 28716, 2006) was implemented. It is a national regulation designed to safeguard and strengthen operational and administrative systems, requiring prior, simultaneous, and subsequent control actions to be implemented. According to RC No. 320-2006-CG (2006), supervision and monitoring are part of the three types of control. Prior control is carried out by the higher levels established for the entity. Thus, in organizing the education sector to fulfill educational services, higher-level entities and the national governing body, MINEDU, have been established in the regions, the DRE, and locally, the UGELs. Each of these has the obligation to implement the three levels of control and to exercise independent prior managerial control through permanent and periodic supervision and monitoring actions.

The purpose of the research is to identify the relationship between decentralized administration, technical and human resources policies, and educational quality management, as influenced by supervision actions and the implementation of information and communication technologies (ICT) in UGEL-Puno, 2023. The general hypothesis (HG) is proposed. The mediating variables, supervision and ICT, directly and indirectly affect the relationship between decentralized administration, technical and human resources policies, and educational quality management at UGEL-Puno, 2023. HE1: The development of decentralized administrative, technical, and human resources policies is related to supervisory actions. HE2: Supervisory actions are related to educational quality management. HE3: The development of decentralized administrative, technical, and human resources policies is related to the development of ICT. HE4: The development of ICT is related to improvements in educational quality.

2 Materials and methods

This is basic, non-experimental research with a causal explanatory scope and a quantitative approach (Supo, 2012). The study population consists of managers, officials, specialists, and administrative workers from the Puno Local Education Management Unit and educational institutions. A probabilistic sample of 203 workers voluntarily participated in a four-variable survey. The independent variable was

decentralized policies, the dependent variable was educational quality management, and the two mediating variables were supervision and information and communication technologies. The instrument used was previously validated by expert judgment, achieving validity and reliability. The SEM-PLS statistical test was used to analyze and evaluate the data.

2.1 Design of the measurement model for the construct of variables

Figure 1 shows that policies on decentralized administrative, technical, and human resources are directly related to improvements in educational quality management. This relationship is mediated by the indirect effects of supervisory actions and the implementation and development of information and communication technologies.

The purpose of the theoretical model presented in Figure 1 is to evaluate how the variables that act as mediators—supervisory actions and information and communication technologies developed by the UGEL-Puno staff—affect the policies related to administrative, technical, and human resources, as well as educational quality management. It is a theoretical model developed within the theory of internal control in organizations (Estupiñán, 2017), which states that supervisory actions and information technologies are important for the performance of operational and administrative activities, as well as the Internal Control Law for the Public Sector (Law No. 28716, 2006), which establishes that permanent supervision of the activities of public entities must be scheduled. Reports on the process must include necessary recommendations for improvement to be effective. (Contraloría General de la República, 2006), ICT is a fundamental tool within the internal control system for ensuring the efficiency of the organization's activities.

2.2 Results of factor loadings for external factors

Table 1 presents the results for the variables that comprise the independent variable: decentralized administration policies (PA1 to PA5), techniques (PP6 to PP10), and human resources (PRH11 to PRH15), where the factor loadings vary from 0.743 to 0.894; for the measurement variables supervision (S16 to S21), with factor loadings from 0.801 to 0.909; and information and communication technologies (ICT 22 to ICT28), where the results vary from 0.802 to 0.904; and the dependent variable, educational quality management (MPC29 to MCP 31; MCO 32 to MCO33; and MC34 to MC 36), which varies from 0.874 to 0.934. In all cases, the indicators are above 0.70, which means that the questions have adequate and reliable validity and reliability criteria for the proposed structural model.

2.3 Validity and reliability results of the measurement and structural model

Another requirement for applying the SEM-PLS statistical test is to demonstrate the validity and reliability of the measurement model of the variables that comprise the multivariate structural model.

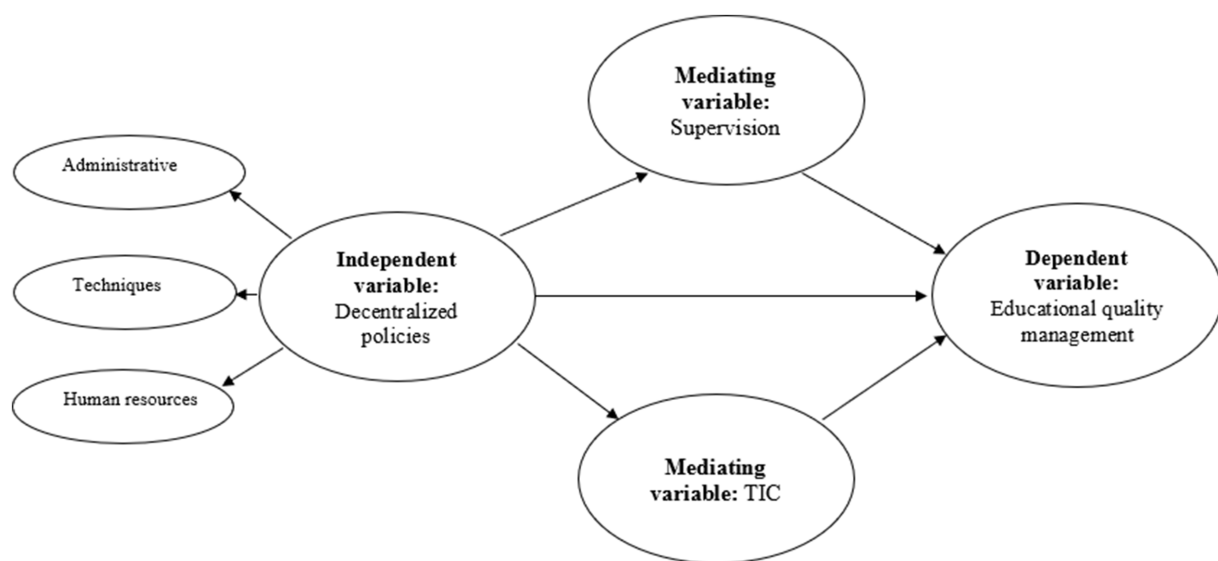


FIGURE 1
Theoretical design of the study's structural model.

Table 2 shows the results of this test using Cronbach's alpha reliability and composite reliability (ρ), both of which are statistics where all variables show indicators above 0.708, the minimum acceptable value. Similarly, the statistical test of average extracted variance (AVE) is above 0.683 in all variables, with the minimum acceptable value being 0.50 (Cepeda and Roldán, 2004). These results allow us to conclude that these instruments are reliable and valid for measuring the latent variables of the model that was designed and proposed for the structural model.

3 Results

3.1 Administrative decentralization policies and educational quality management

The workers who directly implement the functions of UGEL-Puno and the staff of the educational institutions that carry out decentralized administrative management responded to the questionnaire. The questionnaire evaluated the degree of efficiency of these activities, and the results are shown in Table 3. Sixty-eight point 7 % rate the administrative activities assigned to UGEL-Puno as fair to inefficient; 69.80% indicate that human resources processes are fair to inefficient; and 60.10% rate technical planning, programming, and evaluation actions as fair to inefficient. Similarly, the improvement in the educational quality of the educational institutions of UGEL-Puno, as evaluated by the workers involved, shows that 66.50% of planning activities, 68.80% of improvements in pedagogical management, and 65.30% of improvements in student performance evaluation achieve improvements in educational management ranging from fair to inefficient, which indicates that the decentralized activities of administrative management policies are carried out in a manner ranging from fair to inefficient and that employees rate educational quality as fair to inefficient.

3.2 Supervisory actions and the use of ICT

Ongoing and effective supervision contributes to improvements in administrative management and educational quality in educational institutions. The results of the evaluation of the degree of supervision carried out by the Regional Directorate of Education and the UGEL-Puno are shown in Table 4, where 71.90% of respondents state that supervision actions are carried out sometimes and rarely, and only an average of 23% indicate that they are carried out almost always or always. Regarding the implementation of ICT, 72.50% assess the implementation and development of ICT in their activities as fair to very poor, while only 27.60% of respondents indicate that it is good or very good.

3.3 Evaluation of the theoretical structural model and the impact of direct and indirect variables

In this study, the process of decentralized administrative, technical, and human resources policies (PA) was used to model direct and indirect relationships with educational quality management (GCE). The indirect effects originate from the mediating variables: supervision (S) and ICT, because in administrative management, ongoing supervision of policy implementation is essential for achieving objectives and goals. Similarly, ICT provides information for evaluating progress, which is why these are considered intervening variables. Indirect effects are measured using structural equation modeling techniques (PLS-SEM) (Hair et al., 2017).

The results of the direct and indirect relationships described above are shown in Table 5, consolidated by the proposed hypotheses. Standardized coefficients (β) were determined to assess whether predictor variables contribute to the explained variance of the endogenous variable (VI) (Cepeda and Roldán, 2004). In this way, the variables and indicators of the structural model were evaluated: (a) the

TABLE 1 Factor loadings by variables, dimensions, and items.

Variables	Dimensions	Items	Factor loadings
Decentralization of policies	Administrative Policies	PA1	0.743
		PA2	0.847
		PA3	0.805
		PA4	0.823
		PA5	0.832
	Technical Policies	PP6	0.836
		PP7	0.868
		PP8	0.869
		PP9	0.848
		PP10	0.894
	Human resources policies	PRH11	0.810
		PRH12	0.795
		PRH13	0.800
		PRH14	0.833
		PRH15	0.781
Supervisory actions		S16	0.852
		S17	0.801
		S18	0.909
		S19	0.894
		S20	0.869
		S21	0.869
ICT development		ICT22	0.802
		ICT3	0.898
		ICT24	0.854
		ICT25	0.893
		ICT26	0.900
		ICT27	0.890
Improving educational quality	Planning	MCP29	0.891
		MCP30	0.874
		MCP31	0.918
	Improved management	MCO32	0.876
		MCO33	0.923
	Improved performance	MC34	0.911
		MC35	0.934
		MC36	0.911

standardized regression coefficients (β) of the direct relationships of H1, H2, and H3 vary from 0.184 to 0.885, which express the predictive value of the indicators of decentralized administration policies (PA). They are very high in the relationships between Policies and Supervision; Policies and ICT; and very low in Supervision with quality management (GCE), at 0.184; (b) the coefficient of determination (R^2) varies from 0.034 to 0.783 and is positive and direct, with a very low strength of relationship between policies and supervision, while Policies and Supervision and Policies and ICT are

high; (c) effect size (f^2) between two constructs, which measures the effect size of the variance of the constructs (X) explained by the latent variable (Y or Z). These effects are very strong if $f^2 > 0.35$ (Hair et al., 2017). In this case, the effect size in all cases is greater than 0.35; therefore, the relationships among all variables are very strong.

3.4 Testing the hypothesis

General hypothesis: Table 5 and Figure 2 present a summary of the statistical results obtained through PLS-SEM, which identify the indirect effects of the mediating variables, supervision, and information and communication technologies. These indirect effects reflect how the mediating variables (supervisory actions and ICT) influence the direct relationship between decentralized administrative, technical, and human resource policies and educational quality management.

The indirect effect of the variables *Administrative*, *Technical*, and *Human Resource Policies*, *Supervision*, and *Quality Management* yields $\beta_1 = 0.163$ with a DS = 0.051, $t = 3.182$, and $p = 0.001 < 0.05$, indicating a highly significant relationship. Similarly, the indirect effect involving *Administrative*, *Technical*, and *Human Resource Policies*, ICT, and *quality management* results in $\beta_2 = 0.542$ with DS = 0.053, $t = 10.213$, and $p = 0.000 < 0.05$, which is also highly significant.

Similarly, the total direct effects of administrative, technical, and human resource (RR. HH.) policies on educational quality management show a standardized beta coefficient of $\beta_t = 0.217$, with $p = 0.000 < 0.05$. The total indirect effects show a standardized coefficient of $\beta_t = 0.491$ and $p = 0.00$. The value $0.00 < 0.05$ is highly significant. The statistical results analyzed allow us to accept H_{G1} and reject H_{Go} , indicating that supervision activities and ICT serve as mediating variables, indirectly influencing the variables of administrative and technical policies, human resources, and educational quality management in UGEL-Puno.

Specific hypothesis 1: Table 5 presents the statistical results of the direct relationship between the variables: decentralized human administration policies, techniques, and resources, and supervisory actions, where the standardized coefficient is positive, $\beta = 0.882$ with a standard deviation of 0.015; $t = 59.506$; p -value = $0.000 < 0.05$. This result is highly significant, allowing us to accept HE_1 and reject H_o . We conclude that there is a direct relationship between the variables, with $R^2 = 0.778$, indicating that the relationship is 77.80%, which is considered strong. The $f^2 = 3.499$, indicating that the effect of decentralized administration, technical, and human resource policies on supervisory actions is very strong.

Specific hypothesis 2: The statistical results are presented in Table 5, which shows the direct relationship between supervision and educational quality management with $\beta = 0.184$; DS = 0.057; $t = 3.213$; and $p = 0.001 < 0.05$, which is very significant and allows us to accept HE_1 and reject HE_o . There is a direct positive relationship between the two variables. Furthermore, $R^2 = 0.034$, indicating that the intensity of the relationship is 3.40%, which is very low. Additionally, $f^2 = 0.065$, which suggests that the effect of the variable Supervision on educational quality management is strong.

Specific hypothesis 3: Table 5 presents the statistical results of the direct relationship between the variables: decentralized administration policies, techniques, human resources, and information and

TABLE 2 Statistical results of reliability and construct validity.

Variables	Cronbach's alpha	Composite reliability (rho_a)	Average Variance Extracted (AVE)
Administrative, technical, and human resources policies	0.967	0.968	0.683
Supervision	0.933	0.934	0.750
ICT	0.950	0.952	0.771
Educational quality management	0.968	0.969	0.819

TABLE 3 Decentralization policies and educational quality management.

Variables	Development assessment				
	Very inefficient	Inefficient	Regular	Efficient	Very efficient
Policies					
- Administrative	4.3%	32.1%	36.6%	21.3%	5.7%
- Technical	8.9%	26.3%	33.8%	24.4%	6.6%
- Human resources	8.0%	30.0%	39.8%	19.2%	3.1%
Educational quality					
- Planning	5.6%	28.4%	38.1%	22.8%	5.1%
- Management improvement	3.0%	27.3%	41.5%	22.0%	6.2%
- Performance improvement	8.9%	26.1%	39.2%	22.9%	3.0%

TABLE 4 The supervisory actions carried out and the use of ICT.

Mediating variables	Supervisory assessment				
	Never	Bit	Sometimes	Almost always	Always
Supervision	5.0%	29.5%	42.4%	20.9%	2.2%
Use of ICT	3.4%	28.6%	40.5%	24.3%	3.3%

communication technologies, where $\beta = 0.885$; $DS = 0.017$; $t = 50.835$; and $p = 0.000 < 0.05$. This result is highly significant, allowing us to accept HE_1 and reject HE_0 . It can be concluded that both variables have a direct positive relationship. In addition, $R^2 = 0.783$, indicating that the strength of the relationship (78.30%) is very high, and $f^2 = 3.629$, which shows that the effect of decentralized administration, technical, and human resource policies on ICT is very strong.

Specific hypothesis 4: Table 5 shows the statistical results of the direct relationship between the variables: Information and Communication Technologies and educational quality management, where $\beta = 0.612$; $DS = 0.057$; $t = 10.728$; and $p = 0.000 < 0.05$, which is highly significant and allows us to reject HE_0 and accept HE_1 . From this, we conclude that there is a direct relationship between ICT and educational quality management. Furthermore, $R^2 = 0.375$, indicating that the intensity of the relationship is 37.50%, which is low. The $f^2 = 0.699$, which indicates that the effect of ICT on educational quality management is strong.

Specific hypothesis 5: The statistical results presented in Table 5 indicate a direct relationship between the variables: decentralized administration policies, techniques, and human resources and educational quality management, where $\beta = 0.185$; $DS = 0.184$;

$t = 2.906$; and $p = 0.004 < 0.05$, which is very significant and allows us to accept HE_1 and reject HE_0 . From this, we conclude that there is a direct relationship between the two variables. Furthermore, $R^2 = 0.034$, where the intensity of the link between both variables is 3.40%, which is very low. The $f^2 = 0.051$, which indicates that the effect of decentralized administration, technical, and human resource policies, and educational quality management is weak.

4 Discussion

The structure of the latent variables (independent variables) includes decentralized administrative policies, techniques, and human resources, along with their corresponding formative variables (PA1 to PA5; PP6 to PP10; and PRH11 to PRH15), as well as the mediating variables of supervision (S16 to S21) and ICT (ICT 22 to ICT 28), and the exogenous (dependent variable) educational quality management (MPC29 to MCP 31; MCO 32 to MCO33 and MC34 to MC 36), is presented in Table 2. This theoretical model has factor loadings greater than 0.70 (Hair et al., 2017). With these procedures, the instruments and questionnaires meet the appropriate reliability and validity criteria, allowing the evaluation of the initially proposed structural

TABLE 5 Analysis of the direct and indirect effects of the mediation model of supervision and ICT on the relationship between decentralized policies for the administration and management of educational quality.

H	Relationship	β	SE (DS)	T value	p value	Confidence interval 95%		R^2 β squared	f^2	Decision
						LI	LS			
Direct effect										
H1	Administrative, technical, and human resources policies - > supervision	0.882	0.015	59.506	0.000	(0.853)	(0.911)	0.778	3.499	Accept H ₁
H2	Supervision - > Educational quality management	0.184	0.057	3.213	0.001	(0.023)	(0,196)	0.034	0.065	Accept H ₁
H3	Administrative, technical, and human resources policies - > ICT	0.885	0.017	50.835	0.000	(0.851)	(0.920)	0.783	3.629	Accept H ₁
H4	ICT - > Educational quality management	0.612	0.057	10.728	0.000	(0.500)	(0,724)	0.375	0.699	Accept H ₁
H5	Administrative, technical, and human resources policies - > Educational quality management.	0,185	0.184	2.906	0.004	(0.060)	(0.310)	0.034	0.051	Accept H ₁
Indirect effect										
HG 1	Administrative, technical, and human resources policies -> Supervision - > Educational quality management	0.163	0.051	3.182	0.001	(0.062)	(0,262)	0.042		Accept H ₁
HG2	Administrative, technical, and human resources policies - > ICT -> Educational quality management	0.542	0.053	10.213	0.000	(0.437)	(0.645)	0.082		Accept H ₁
	Total indirect effect	0.491	0.078	6.254	0.000	(0.337)	(0.646)	0.241		Accept H ₁

model through the measurement model, with Cronbach's alpha greater than 0.708. The mean extracted variance (AVE) is also greater than the minimum acceptable value of 0.50 (Cepeda and Roldán, 2004; Hair et al., 2017).

These results indicate that the instruments allowed for the reliable and valid measurement of latent variables, as well as confirming the measurement model designed for the theoretical structural model, which enabled us to establish the effects of the mediating variables, supervision, and information and communication technologies on the relationship between decentralized administration policies, techniques, human resources, and the management of education quality at UGEL-Puno. These findings are consistent with the study by Ayanwale and Oladele (2021), which modeled the four variables in their research.

The evaluation of the behavior of the study variables shows that the decentralized administrative policies, technical aspects, and

human resources assigned to UGEL-Puno are, on average, 66.20% inefficient to fair. This influences the progress of educational quality management, which is shown to be 67.20% fair to inefficient. Similarly, 71.90% of respondents stated that the supervisory activities implemented by the DREP and UGEL managers in the administrative processes at educational institutions are carried out sometimes or rarely. Additionally, 72.50% of respondents rated the information and communication technologies implemented and developed in the UGEL and IE as fair to very poor. Clearly, these deficiencies have influenced the quality of education management in the EBR of the UGEL Puno. These results contradict the objectives of MINEDU, which expects that significant changes in the decentralization of administrative management in education will lead to significant progress after more than 15 years of implementation.

The results coincide with the research conducted by Pérez (2020) at the Chiclayo Local Education Management Unit (UGEL), which

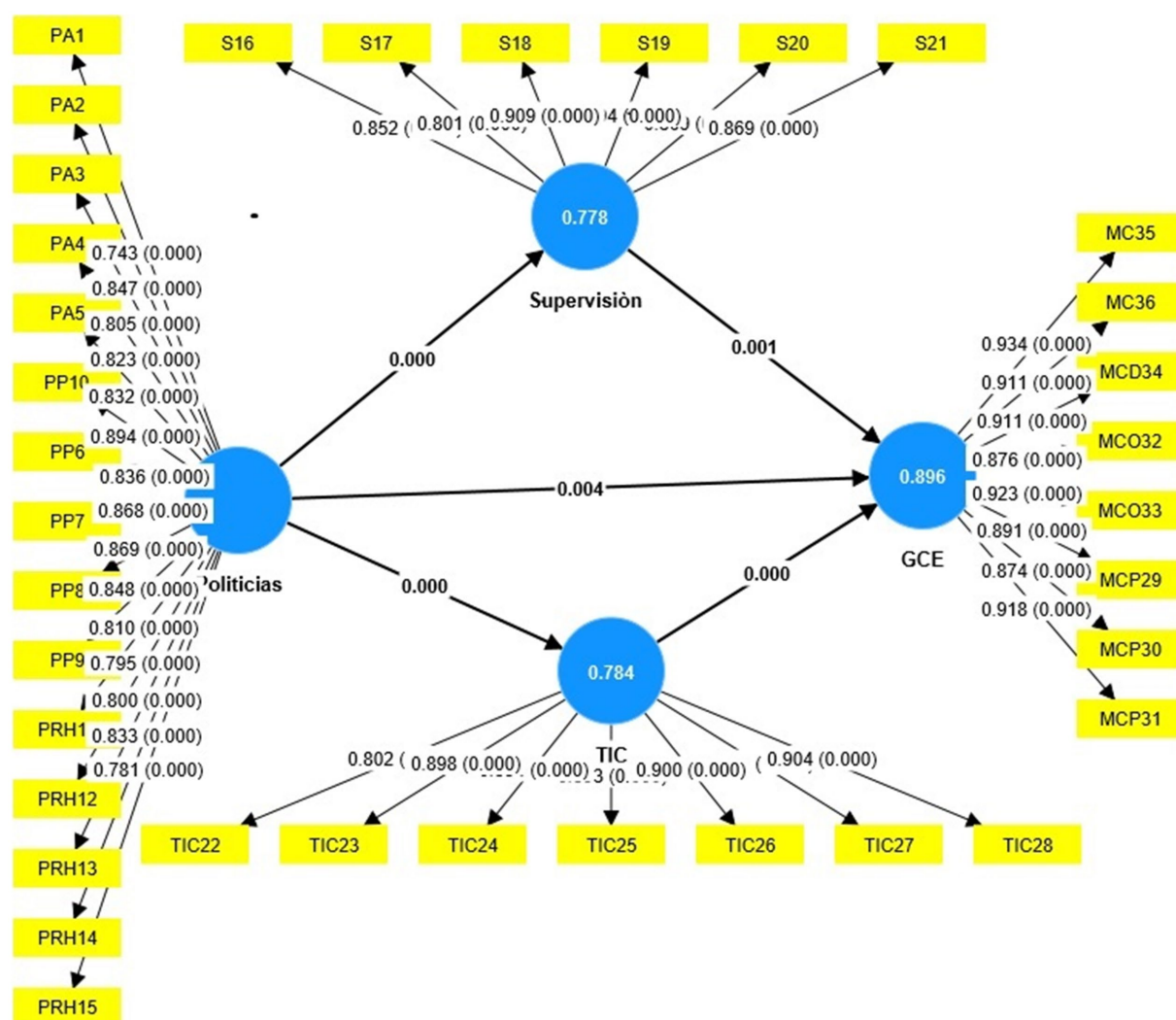


FIGURE 2
Statistical results of PLS-SEM and Bootstrapping to test the Hypothesis.

concludes that the commitment of the main actors involved in educational quality is scarce and deficient. Similarly, Mamani (2018), in his study evaluating internal control and its impact on the administrative management of UGEL-Puno, showed that the level of development of these activities is quite low or nonexistent in some administrative areas, which also influences poor management in the planning, organization, and direction processes, resulting in the failure to achieve institutional objectives.

Direct and indirect relationships with educational quality management (GCE) were modeled, mediated by the intervention of supervisory actions (S) and (ICT), which enable the modeling of causal relationships that maximize the explained variance of the latent dependent variable (Hair et al., 2017). These direct and indirect relationships indicate the following results: (a) the path coefficients (β) range from 0.184 to 0.885, meaning that decentralized administration, technical, and human resources policies (PA) have a significant direct relationship with the supervision variable with GCE (0.184) being the lowest; (b) the coefficient of determination (R^2) varies from 0.034 to 0.783 and is positive and direct; and (c) the effect size (f^2) of the constructs (X) explained by the latent variable

(Y or Z) is very strong ($f^2 > 0.35$). These results are comparable to other research studies developed using SEM-PLS techniques (Norabuena et al., 2021; Geldrech, 2019), which evaluated the structural model through the components of the measurement model and subsequently the structural model with the coefficients β , R^2 , and f^2 .

This is also corroborated by research carried out using relational studies, such as Flores et al. (2021), which concludes, using metadata, that it is important for everyone involved in the educational process to participate, but that it is necessary to establish and strengthen the path to effective participation in decentralized management to ensure equity among the actors involved in closing educational gaps in the territorial scope of the UGELs. Similarly, Quinteros (2023) states that “there are positive and significant relationships between enrollment levels, the administrative implementation system, and the school census with the infrastructure implemented in the educational institutions of the UGEL-San Martín by 2022.” Similar to the research by Bejar (2022) on ICT implementation (E-Government) in UGEL-Puno, it indicates that a new diagnosis is necessary, using innovative technologies, and that there is still a long way to go to achieve

efficiency, effectiveness, and flexibility in the performance of UGEL-Puno. Mamani (2018) and Geldrech (2019) determined that there is a low positive relationship between planning and learning levels. Compliance with educational management standards is lacking due to staff's insufficient knowledge of internal control standards and a lack of ongoing training.

Similarly, Álvarez (2010) and Suarez (2023) states that, in the Peruvian context, the implications of educational policies require the consolidation of a serious decentralization process through the real transfer of powers and resources to regional governments, Regional Education Directorates, and Local Education Management Units (UGELs), accompanied by training programs for managers, supervisors, and teachers to strengthen their capacities in management, supervision, and pedagogical use of information and communication technologies (ICT). Similarly, supervision must be transformed into a technical support mechanism that promotes pedagogical improvement. The progressive implementation of ICT requires guaranteeing infrastructure, connectivity, and training to reduce geographical and socioeconomic gaps. It is also essential to implement monitoring and evaluation systems with indicators that allow for assessing the impact of these policies, ensuring equity in access to quality education.

5 Conclusion

The implementation of decentralization policies for administrative management to achieve educational quality is still very weak ($R^2 = 0.034$), showing that this policy alone is insufficient. The impact of the mediating variables of supervision and information and communication technologies is very significant and strong ($f^2 > 0.35$) in the direct relationship between decentralized management policies and educational quality management. In other words, the effectiveness of decentralization in improving educational quality does not lie in its mere implementation but in the strengthening of ongoing supervision and investment in technology.

There is a direct and positive relationship between supervision and educational quality management. The standardized coefficient ($\beta = 0.184$) indicates that this effect is weak; to the extent that greater supervision and ongoing monitoring actions are implemented, educational management will be of higher quality. Its impact is limited.

It is concluded that investing in information and communication technologies (ICT) directly improves educational quality management. The relationship is strong ($\beta = 0.612$), which means that to improve educational quality, investment should be increased, and the adequate implementation of information and communication technologies should be ensured.

References

- Álvarez, N. (2010). Educational decentralization in Peru. *Education* 19, 7–26. doi: 10.18800/educacion.201002.001
- Ayanwale, M. A., and Oladele, J. I. (2021). Path modeling of online learning indicators and learners' satisfaction during the Covid-19 pandemic. *Eur. J. Train. Dev. Stud.* 8, 1–13. Available at: https://www.ijcc.net/images/Vol_15/Iss_10/151038_Ayanwale_2021_E1_R.pdf
- Bejar, G. V. (2022). *E-Government as a tool for improving management at the UGEL-Puno*. Master's thesis, Universidad Nacional de Altiplano de Puno. Postgraduate School. Available online at: <https://www.proquest.com/openview/a04cf0c30d56fd3a0784d7a8bc953fab/1?cbl=2026366&diss=y&pq-origsite=gscholar>.
- Cepeda, G., and Roldán, J. (2004). *Applying the PLS technique in practice in business administration*. IDUS. Available online at: https://idus.us.es/bitstream/handle/11441/76333/aplicando_en_la_practica_la_tecnica_pls.pdf?sequence=1&isAllowed=y.
- Consejo Nacional de Educación. (2007). *National Education Project to 2021. MINEDU*. Available online at: <http://www.minedu.gob.pe/DeInteres/xtras/PEN-2021.pdf>.
- Contraloría General de la República. (2006). *Internal Control Standards for the Public Sector. Comptroller Resolution No. 320-2006-CG*. Available online at: <https://www.gob.pe/institucion/contraloria/normas-legales/396703-320-2006-cg>.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Author contributions

DM: Conceptualization, Investigation, Writing – original draft. JJ: Conceptualization, Methodology, Software, Writing – review & editing. AC: Investigation, Methodology, Writing – review & editing. JF: Formal analysis, Supervision, Validation, Writing – original draft. JL: Data curation, Formal analysis, Writing – original draft.

Funding

The author(s) declare that no financial support was received for the research and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The authors declare that no Gen AI was used in the creation of this manuscript.

Any alternative text (alt text) provided alongside figures in this article has been generated by Frontiers with the support of artificial intelligence and reasonable efforts have been made to ensure accuracy, including review by the authors wherever possible. If you identify any issues, please contact us.

Publisher's note

All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations, or those of the publisher, the editors and the reviewers. Any product that may be evaluated in this article, or claim that may be made by its manufacturer, is not guaranteed or endorsed by the publisher.

- Del Río, O. (2009). Public management and development - compendium of terminology related to public management. Lima: Caballero Bustamante Editions.
- Estupiñán, R. (2017). *Internal control and fraud COSO I, II and III*. Bogotá, Colombia: ECOE Editions. Available online at: <https://www.ecoediciones.mx/wp-content/uploads/2015/07/Control-interno-y-fraudes-3ra-Edicio%CC%81n.pdf>.
- Flores, K., Montoya, A., Vásquez, C., and Cánez, R. (2021). Decentralized educational management with self-esteem and teacher performance in public educational institutions in rural and urban sectors at the UGEL san Román 2019 territorial approach. *Rev. Venezolana de Gerencia (RVG)* 26, 65–76. doi: 10.52080/rvgluz.26.e5.5
- Geldrech, S. P. (2019). *Impact of educational planning on the pedagogical management of the improvement process in early childhood education institutions*. Doctoral thesis, Universidad Nacional de Altiplano de Puno. Graduate school. Available online at: <http://repositorio.unap.edu.pe/handle/20.500.14082/13478>.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., and Sarstedt, M. (2017). A primer on partial least squares structural equation modeling (PLS-SEM). 2nd Edn. Thousand Oaks, CA: Sage Publications, Inc.
- Inca, H. H. (2019). *Self-esteem and teaching performance in public educational institutions in rural and urban areas at the san Román 2019*. Doctoral thesis, Universidad Nacional de Altiplano de Puno. Graduate school. Available online at: <http://repositorio.unap.edu.pe/handle/20.500.14082/13472>.
- Law 28044. (2003). *General Education Law*. Congreso de la República. *Diario Oficial el Peruano*, 17 de julio de 2003. Available online at: <https://www.gob.pe/institucion/minedu/normas-legales/3844908-28044>.
- Law No. 28716. (2006). *Internal Control Law for State Entities*. Congreso de la República del Perú. *Diario Oficial El Peruano*. Available online at: https://www.peru.gob.pe/docs/PLANES/11654/PLAN_11654_Ley%20n%2028716_2010.pdf (Accessed April 18, 2006).
- Mamani, L. R. (2018). *Evaluation of internal control activities and their impact on the administrative management of the local education management units of the Puno region, 2015–2016*. Master's thesis, Universidad Nacional del Altiplano de Puno. Graduate school. Available online at: <http://repositorio.unap.edu.pe/handle/UNAP/7961>.
- Mejía, F., and Torres, E. (2020). *Implementation of a new evaluation model for teacher appointments to reduce violence among secondary school students at UGEL no. 02*. Master's thesis, Pontificia Universidad Católica del Perú. PUCP. Available online at: <http://hdl.handle.net/20.500.12404/18463>.
- Ministry of Education. (2015). *San Martín: how are we doing in education?* Available online at: <http://repositorio.minedu.gob.pe/handle/123456789/4718>.
- Norabuena, C., Huamán, A., and Ramírez, E. (2021). Structural equation model (with PLS estimation) based on service quality and customer loyalty of Peruvian rural banks. *Rev. Cienc. Adm.* 18, 1–14. doi: 10.24215/23143738e081
- Pérez, D. J. (2020). *A model for evaluating educational policies for José Leonardo Ortiz-UGEL-Chiclayo institutions [PhD thesis, César Vallejo university]*. UCV. Available online at: <https://hdl.handle.net/20.500.12692/43448>.
- Quinteros, R. F. (2023). *Educational administration and school infrastructure at the san Martín University of Technology (UGEL), 2022*. Doctoral thesis, Universidad Cesar Vallejo. Available online at: <https://hdl.handle.net/20.500.12692/106716>.
- Suarez, P. M. (2023). *Performance commitments in decentralization in Peru undergraduate thesis, pontifical Catholic University of Peru – PUCP*. Available online at: <http://hdl.handle.net/20.500.12404/24385>.
- Supo, J. (2012). *Scientific research methodology*. Arequipa, Peru: Biostatistics EIRL.
- Torres, Z. (2014). *Strategic management*. Mexico: PATRIA Publishing Group.
- UNESCO National Education Council. (2017). *Review of public policies for the education sector in Peru*. Available online at: <https://unesdoc.unesco.org/ark:/48223/pf0000260875>
- Vega, L., and Nieves, A. (2016). Procedure for managing supervision in internal control. *Holguen Sci.* 22, 1–19. Available at: <https://www.redalyc.org/pdf/1815/181543577007.pdf>