

Quality management systems and educational quality in Mexican Higher Education Public Institutions

Methodology

Statistical methods allow determining the impact on educational quality of the constructs, strategic planning and process management in public HEIs that have implemented quality management systems (QMS).

Objective

Investigate the impact of strategic planning in public higher education institutions (HEIs) on the quality of education, as well as the impact of process management, since it must be aligned with the strategic plan and integrate the guidelines of the groups.

Introduction

The changes in the global scenario have a direct impact on the requirements of Higher Education Institutions, being necessary to establish a management system that integrates a standardized evaluation to guarantee educational quality.

Result or conclusion 1

Public institutions of higher education in Mexico that seek educational quality face the dilemma of considering the r context for their adequate strategic planning to effectively achieve goals and objectives for continuous improvement.

Results or conclusion 2

Process management has an impact on the educational quality of HEIs by systematizing and controlling processes efficiently. However, strategic planning is a determining factor in identifying and achieving the appropriate objectives for each institution and guaranteeing educational quality.

Result or conclusion 3

The obstacles in for achieving educational quality in public institutions of higher education in LATAM will be solved as the goals and objectives derived from strategic planning are identified and achieved and operated with the corresponding process management.



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Los sistemas de gestión de la calidad y la calidad educativa en Instituciones Públicas de Educación Superior de México

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Abstract: global competitive markets characterized with new regulations, higher education institutions require management systems to assure the achievement of goals and objectives. Thus, quality in processes and work routines imply systems certified in ISO 9001 or 21001 from external parties. This study analyzes the impact of process management and strategic planning on educational quality of 48 public universities in Mexico that belong to a national association and hold ISO 9001:2015 certifications. The objective is centered in determining the effect of process management and strategic planning on educational quality. By using partial least squares structural equation modelling through Smart PLS, results indicate that process management has a positive impact on educational quality; while strategic planning has no impact on the dependent variable. In one hand, the significant result of process management on educational quality is consistent with literature about quality management systems at higher education institutions. On the other hand, the non-significant impact of strategic planning on educational quality is consistent with studies including public institutions with budgets not dependent on institutional performance or student admissions.

Keywords: ISO 9001, certification, university, quality management system, educational quality, strategic planning, process management, ISO 21001.

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Resumen: el actual mercado globalizado de la educación superior propicia nuevos marcos regulatorios para las instituciones que generan la necesidad de sistemas de gestión para el seguimiento y control de objetivos y metas. El aseguramiento de la calidad implica la obtención de acreditaciones y certificaciones por entidades externas basadas en la norma ISO 9001 y la nueva norma ISO 21001. La presente investigación analiza el impacto de las variables de gestión por procesos y de planeación estratégica en la calidad educativa en una muestra de 48 Instituciones Públicas de Educación Superior (IES) de México, pertenecientes a una asociación nacional que cuentan con un sistema de gestión de calidad certificado de acuerdo con la norma ISO 9001:2015. El objetivo del estudio es determinar la incidencia de la gestión por procesos y de la planeación estratégica en la calidad educativa en las IES públicas de México. Mediante el uso de ecuaciones estructurales ajustadas por mínimos cuadrados parciales, los resultados señalan que la gestión por procesos tiene un impacto positivo en la calidad educativa; mientras que la planeación estratégica no presenta impacto en la variable dependiente. Estos hallazgos son consistentes con la literatura, incluyendo la no significancia de la planeación estratégica con la calidad educativa debido a la naturaleza de instituciones públicas con fondos no vinculados al desempeño o la matrícula.

Palabras clave: ISO 9001, acreditación, educación superior, sistema de gestión, calidad educativa, planeación estratégica, gestión por procesos, ISO 21001.

Introduction

Institutions require strategies to achieve their objectives and improve teaching and learning. The linkage of strategic educational management processes that integrate the learning community is essential to recover and improve school performance (Hernández and Miranda, 2020). HEIs also need to adapt to constant external changes of high competitiveness (Tamutienė and Matkevičienė, 2019), in addition to exposing the quality of their different processes through results and generating a reference support to increase their quality levels (Hota and Sarangi, 2019), which reflect the continuous improvement derived from their organizational processes and their value creation (Degtjarjova *et al.*, 2018). The above generates imbalance between the internal quality levels in HEIs and the changing dynamics of the environment (Tadesse *et al.*, 2018), which demand an increase in regulations in the sector (Araya *et al.*, 2018), so that quality is considered a priority in education (Hwang Choi, 2019).

While the Quality Management System (QMS) serves as a response to societal demands for accountability and impact, it is clear that it entails a commitment to accountability from all participants in the Higher Education Institution (HEI). Specifically, the purposes of Quality Management contemplate compliance, control, accountability and improvement (Harvey, 2018). The new global scenario and the technological environment have led universities to focus on quality management to achieve efficiency and effectiveness in the management of educational processes, as

a response to the internal and external changes that education has undergone (Gutiérrez and Morales, 2020).

UNICEF (2019) points out that the development of the strategic plan in public and private organizations in Latin America is focused on the internal scheme and the achievement of goals and omits external factors, which permanently affect the change of strategies that respond in accordance with their resources and goals in decisions. The excess of bureaucracy in the institutions, inadequate government policies and the absence of competent personnel to implement them are obstacles in the development of the strategic plan.

The lack of strategic management in most public educational institutions affects the development of the educational project, since the vision and mission omit the real diagnosis of the institution, hindering the achievement of goals and objectives and the operational efficiency. The lack of educational planning is the result of scarce technical and operational information at the managerial levels (Hernández and Fernández, 2018), generating a situational strategic planning with ineffective pedagogical work that limits the achievement of goals and objectives (Díaz and Villafuerte, 2022).

The aim of the paper is to determine the incidence of process management and strategic planning on educational quality in public HEIs in Mexico. The relationships between the aforementioned variables are analyzed by means of structural equations and the results are contrasted with the literature.

Accreditation of a HEI

Accreditation represents a way to support quality externally, used by most national HEIs. The presence of quality in institutional accreditation is considered when evaluating the service of HEIs and their processes (Karahan and Mete, 2014). The updating of training offerings based on reality is reflected in their curricula and their capacity to respond to educational needs, in accordance with the aspirations of the population (Cardona et al., 2020).

It is a planned and systematized evaluation process of an institution or a particular HEI program to establish the degree of compliance, maintenance or improvement of acceptable standards of education, scholarship and infrastructure. Accreditation applies to a particular program and emphasizes the scope of peer review of a particular field of study. Institutional accreditation in HEI is a thorough examination to define whether the educational institution responds a certain standard to achieve a recognition level, and it must align the performance in the field of teaching and research with scientific standards and achieve the educational plans and goals of a certain area (Saviani, 2020).

Basically, there are three accreditation models: regulated market supervised by the State, State control and shared. The first is a model with very little public funding and with a large number of agencies competing in a regulated market. The accreditation agencies are specific to one subject or related to various sectors. The second model is rare and prevails in countries where the State wants to control quality and relates it to funding. In the third model, the State has full responsibility for the provision of quality education, supporting the HEIs in a shared way in the process of program accreditation, which in their autonomy manage the processes. Thus, the participation of the State is relevant for achieving the effectiveness of the quality processes of the educational system (Botero et al., 2021).

ISO 9001:2015 Standard

One of the strategies to ensure that universities are conformed and prepare qualified human

talent with the competencies demanded by the current global context is to follow a quality management system, such as ISO. In reference to higher education institutions, this management system is a determining factor for their functioning. Among other aspects, it includes the necessary elements to establish policies, objectives and processes necessary for achieving strategic objectives of an organization (Becerra et al., 2019).

The quality approach starts from its evaluation, derived from its comparative reference for its assessment (Nicoletti, 2021), thus requiring a quality management approach in HEIs that combines management processes in relation to current national models. Diagnosis locates the level of a program or the institution to identify areas of improvement (Rengifo-Millan, 2017). Quality in education is related to the learning goals, the contents that, at the end of schooling, should be known and know how to do through internal and external evaluation, and from the competency model (Montes and Gamboa, 2018). Quality in HEIs meets the balance of education (processes, environment, results) in relation to specific needs, requirements, standards (Belash et al., 2015).

Following a strategic perspective focused on quality and using continuous improvement management models or systems and the ISO 9001 Model, represents the right path to obtain a competitive advantage in any educational institution that seeks to position itself in a prominent place, not only locally but internationally (Castka and Balzarova, 2018). The ISO 9001:2015 Standard in HEIs perceives education from the demand of what students require and not from the presentation of academic offerings.

The support provided by ISO 9001 for establishing other management standards, such as ISO 14001 for environmental management and ISO 21001 for HEI education management, follow the same structure and organization. ISO 9001 represents a benefit in HEIs to obtain better control and improvement of the administrative and educational process, providing advantages and benefits, as well as savings and substantial improvements (Del Castillo et al., 2018).

Benefits of ISO 9001 in Higher Education

The increase in productive and research capacity is among the benefits derived from the ISO 9001 Standard, since the dynamics of improvement incorporates all areas and is adopted as a work tool. Research will mean a simple model for integrating the modifications required to manage change. In addition to the integration of the university in terms of academic and social aspects, since one of the requirements of the ISO Standard establishes mutual benefit in relationships. Best practices and success stories with their results can be shared with other universities in addition to coordinating exchange activities, increasing the level of their professors, students and research (Didriksson, 2016).

It gives the organizational context a view to quality work, since HEIs not only improve organizational activities, but also academic ones. The effects of intertwining one process with others will increase the activities focused on innovation and those related to research. Ultimately, the community focuses on working towards the achievement of common goals (Ceballos, 2014). Certification processes generate certainty from their inception, implementation and certification, and those responsible for HEIs will seek to share significant achievements with the university community, i.e., the involvement and conviction of the community grows, increasing the integration of students and dissemination of extension and specialization programs (Vizcaíno and Martínez, 2014).

Rodríguez (2015) points out that an ISO 9001 certificate represents a reliable support to meet customer expectations. Hernández *et al.* (2017) mention the main advantages of implementation in HEIs: it increases the degree of trust, strengthens research, documentation of processes, involvement, management and control of performance and improves the perception of the institution. It is intended to acquire and contribute to knowledge, in addition to providing the competencies demanded society (Vega and Mestanza Chochabot, 2021).

In educational institutions, which deliver technological and scientific results for the sector

such as business, the ISO21001-2018 Standard encourages to establish the process vision by developing, implementing and improving the effectiveness of the Management System in Educational Organizations (SGOE), particularly focused on increasing the satisfaction of the student, as well as other beneficiaries (ISO 21001-2018 Standard).

ISO 21001 Standard

By presenting a Quality Management System (QMS), it is possible to offer an educational offer that meets internationally recognized standards and requirements, which guarantee its competitiveness in the global scenario of universities with high educational prestige. This is how curricular bases and educational curricula present learning and meet the needs of the international, national and knowledge society context (Oliva, 2019; Cardona *et al.*, 2020; García, 2018; Baeza and Lamadrid, 2018). The proliferation of degrees led to a differentiation in quality, requiring the intervention and control measurement by national systems (CEPAL, UNESCO, 2020).

The ISO 21001 Management Systems for Educational Organizations standard comes into force from May 2018, representing the first international standard. It contemplates the formation of the rules in its levels, in addition to those it omits (adult education, special education, continuing education, languages, etc.), the way it is taught, whether it is classroom-based, distance, online or mixed. It is similar to ISO 9001:2015 (see Table 1) and also considers other international standards focused on education.

The standard focuses on student satisfaction in learning while ISO 9001 focuses on customer satisfaction in service. The relationship with stakeholders defines its performance towards the educational community, in addition to social responsibility in its projection into the future. Accessibility and equity are relevant as inclusion model and in response to the individual and special needs of students. It is worth mentioning the ethical professional environment that emphasizes equitable treatment and confidentiality in the control and handling of data (see Table 1).

Table 1

Correspondence between the ISO 9001:2015 and ISO 21001:2018 standard

ISO 9001:2015	ISO 21001:2018	Explanation
Customer centered	Focuses on students, their needs and other beneficiaries	Meets the requirements of students and other beneficiaries and exceeds their expectations.
Leadership	Visionary leadership	Stakeholders in the creation, drafting and implementation of the mission, vision and objectives must be involved. The leader maintains unity of purpose and direction, creating conditions for achieving the objectives.
Commitment of people	Commitment of people	The people involved must be competent, empowered and committed to delivering value.
Process approach	Process approach	Management of activities according to interrelated processes.
Improvement	Improvement	Focuses on continuous improvement towards the objectives and goals.
Evidence-based decision making	Evidence-based decision making	Analysis and evaluation of data and information as a basis for decision making.
Relationship management	Relationship management	Relationships with stakeholders (suppliers and collaborating partners) are managed.
	Social responsibility	Social responsibility as a prerequisite for long-term success.
	Accessibility and equity	Inclusion, flexibility, transparency and accountability in managing students' individual and special needs, interests, abilities and backgrounds.
	Ethical behavior in education	Ethical professional environment with equitable treatment of stakeholders.
	Security and data protection	Data control with care and confidentiality.

Calidad educativa

La calidad educativa es un indicador que justifica los distintos planes y reformas del sistema educativo, con el propósito de materializar el concepto de calidad, en términos de eficiencia y eficacia. Esto es, cumplimiento con estándares establecidos con un campo de aplicación en la educación superior (Pedraja *et al.*, 2020). Integra objetivos para los sistemas de evaluación con orientación a ser un proceso que maneje controles en el seguimiento de la labor pedagógica, en docentes y educandos, que verifica el alcance de los procesos integrando medidas de mejora. La contribución que generan las auditorías de calidad consiste en apoyar a los directivos de las IES a integrar mecanismos para incentivar la calidad

y aportar los hallazgos en términos de mejores prácticas y experiencias (Huisman *et al.*, 2015).

Educational quality

Educational quality is an indicator that justifies the different plans and reforms of the educational system, with the purpose of materializing the concept of quality in terms of efficiency and effectiveness, i.e., compliance with established standards in higher education (Pedraja *et al.*, 2020). It integrates objectives for evaluation systems oriented to be a process that manages controls in the follow-up of the pedagogical work in teachers and students, and verifies the scope of the processes, integrating improvement measures. The contribution generated by quality audits is

to support HEI managers to integrate mechanisms to encourage quality and provide findings in terms of best practices and experiences (Huisman *et al.*, 2015).

Evaluation proposes quantifiable data on educational quality, since inadequate practice hinders the achievement of institutional goals (Calles and Luna-Nemecio, 2020). Review and control tools to educational processes with a view to classifying institutions have been recommended to seek international certification with ISO 9000 standards.

Process management

Educational institutions have shown a trend towards process management to achieve more technical efficiency at the organizational level and orientation towards university quality (López *et al.*, 2018) and institutional success, in addition to fostering innovation and total quality (Bonilla *et al.*, 2018). The vision of processes conforms input and output mechanisms, and the sequence, interaction with other processes, as well as their monitoring, measurement of performance indicators should be determined to guarantee the effectiveness of the operation.

The process management model allows defining the starting point of the organization, the goal and the activities necessary to achieve the planned objectives (Jiménez *et al.*, 2018). The process is made up of a set of defined, repeatable and measurable activities whose essence is to transform inputs into elements that generate contribution for customers. The classification of processes depends on their purpose, importance, scope and orientation. In relation to their purpose, they can be considered strategic, key and support processes. Those that provide support for the key processes to function effectively are support processes aimed at providing the requirements for the essential processes, which are: human resources, general administration and physical plant or locations. The processes that determine the achievement of objectives, their monitoring and control are strategic processes (Zelt *et al.*, 2018). They belong to the responsibilities of management made up of short, medium and long-term action plans. They are based on

determining strategies to design and improve areas such as: academic, financial, research, budgetary, organizational and evaluative planning at the institutional level.

The documentation of processes propitiates a confidence to stakeholders, control measures to provide a quality assurance, commitment and integral participation of the institution, optimizing the different administrative processes in an efficient and effective way (Moreta and Moyolema, 2017). Therefore, the following hypothesis emerges:

H1: Process management in HEIs has a positive impact on educational quality.

Strategic planning

An organization's strategy has traditionally been defined in terms of goals and objectives that determine a course of action with the necessary resources. For Rincón (2019) the strategic plan is the means to locate the organization in terms of how it is, what it wishes to achieve and the necessary paths it requires on the way to improve certain aspects, modifying the current reality towards the achievement of a specific goal and the way to develop it (Vergara *et al.*, 2021). In the quality of education, the strategy defines the vision of the future to be achieved and the process that leads to achieving it (García *et al.*, 2018). It is important to consider the importance of planning the quality management system, which is aligned with the strategic plan of the institution, in addition to integrating the guidelines of the stakeholders (Díaz and Salazar, 2021).

Regarding HEIs and the fulfillment of strategic plans, they have opted to generate development plans in which short-, medium- or long-term goals and objectives are defined. HEIs seek to create transparency, develop and achieve goals through the adequate use of human and material resources, the design of a curricular program at different levels and an institutional scheme regulated by a strategic plan, which provides the conditions to operate in a scheme of effectiveness, efficiency and productivity. Strategic planning constitutes a valuable guide in terms of competitive advantage, since it fosters the development

of educational resources and directs the IEs to a common vision and direction (Al-Hasanat *et al.*, 2021). It establishes monitoring and evaluation, reduces uncertainty and increases the possibility of monitoring, evaluating and identifying strategic interests (Madzimure and Mashishi, 2021). It also promotes the linkage of the institution and is the basis for improving the quality of education at all levels (Cruz and Santos, 2021), enabling change in the HEI from the actual state to the desired state and establishes the school as an active space focused on quality improvement (Priyambodo and Hasanah, 2021). Therefore, the following hypothesis emerges:

H2: Strategic planning in HEIs has a positive impact on educational quality.

Materials and Method

This article is quantitative with a causal correlational approach. The design is cross-sectional, as data was collected in a determined period of time during the first semester of 2022. Also, a sample of 52 Higher Education Institutions located in Mexico, which have a QMS aligned and accredited according to the ISO 9001: 2015 Standard, was selected. Regarding the design of the instrument, items focused on process management (VIGP) based on Hrabal *et al.* (2020); Hernaus *et al.* (2012); Solis (2018) and Saravia *et al.* (2020) items focused

on strategic planning (VIPE) based on Das *et al.* (2011); Healey *et al.* (2015); Jimoh *et al.* (2016); Elbannaa *et al.* (2016) and López *et al.* (2020); as well as items focused on the dependent variable on educational quality (VDCE) whose elaboration is based on the vision of the Universidad Autónoma de Nuevo León (UANL, 2018).

The target population is made up of 115 public HEIs associated with ANUIES that have implemented and certified an ISO 9001:2015 Quality SG, considered as a population census, which makes up the population of interest. The selection of these HEIs is due to the fact that within the requirements that HEIs must meet to belong to ANUIES to make valid and operational the management of the variables of this study. Likewise, it is important to mention that the selected HEIs cover approximately 50 % of the total enrollment of higher education students in Mexico enrolled in public institutions.

Regarding the profile of the HEIs, 48 out of 115 participated, representing 48% of the population census. Regarding the educational subsystem to which the participating HEIs belong: 23 % are Decentralized Units of the National Technological Institute of Mexico, 23 % are Federal Units of the National Technological Institute of Mexico, 23 % are State Public Universities, 15 % are Technological Universities and the rest (16 %) belong to other types of subsystems (see Table 2).

Table 2

Classification of HEIs in the study

Educational subsystem HEIs	%
Decentralized Units of Tecnológico Nacional de México	23 %
Federal Units of Tecnológico Nacional de México	23 %
State Public Universities	23 %
Technological Universities	15 %
Other	16 %

In relation to the position in which they work and their seniority, 66.6 % of the participants work in the planning area and only 29 % in the quality area; and a little more than half of the participants (56%) stated that they had been in the position

for between one and five years.

Regarding the unit of analysis, planning directors and/or quality directors at the institutional level were considered. This choice is due to the fact that the planning directors are the ones

who coordinate the elaboration and follow-up of the Strategic Plans of the HEIs, while the quality directors are the ones who follow up the implementation of the ISO 9001 Quality Management Systems in the institutions under study.

As for the profile of the participants, 54 % of the participants are men and 46 % are women. Their ages are: 58.5 % of the participants are between 41 and 60 years old, followed by those between 21 and 40 years old (35.5 %). Only 6 % of the participants said they were over 60 years of age. The educational background of the study population revealed that 75 % had a master's degree.

With respect to the application of the instrument, the directory of those responsible for the QMS in the HEIs that are part of the National Association of Universities and Institutions of Higher Education of Mexico (ANUIES) was used. Therefore, quality coordinators and academic directors responded to the questions that make up the measurement instrument during the first semester of 2022.

In relation to the classification by number of students of the HEIs, 6 % stated that they had 1000 or less students, 52 % between 1001 and 5000 students, 10 % between 10 001 and 50 000

students, 19 % between 5001 and 10 000 students and 13 % more than 50 000 students. In relation to the number of employees working in the HEIs, they are as follows: 54 % of HEIs are small (500 or less employees), 29 % are medium (between 501 and 5000 employees) and 17 % are large (more than 5000 employees). With respect to the ISO 9001:2015 QMS: 77 % reported having more than ten years with the system, followed by 15 % who reported having between six and ten years with the QMS; and only 8 % reported having between one and five years with the system.

Results

The reliability results of the instrument integrate Cronbach's Alpha metrics (Table 3), higher than 0.70 for each of the variables. Similarly, the AVE (Average Variance Extracted) is included, being an estimate of the percentage variance degree established by the latent variable component for measuring the error variance (Hair *et al.*, 2017). The above shows that the latent variables, when placed above 0.50, explain at least half of the variance of their indicators. Table 3 shows the latent variables and the results comply with the convergent validity in the AVE column.

Table 3

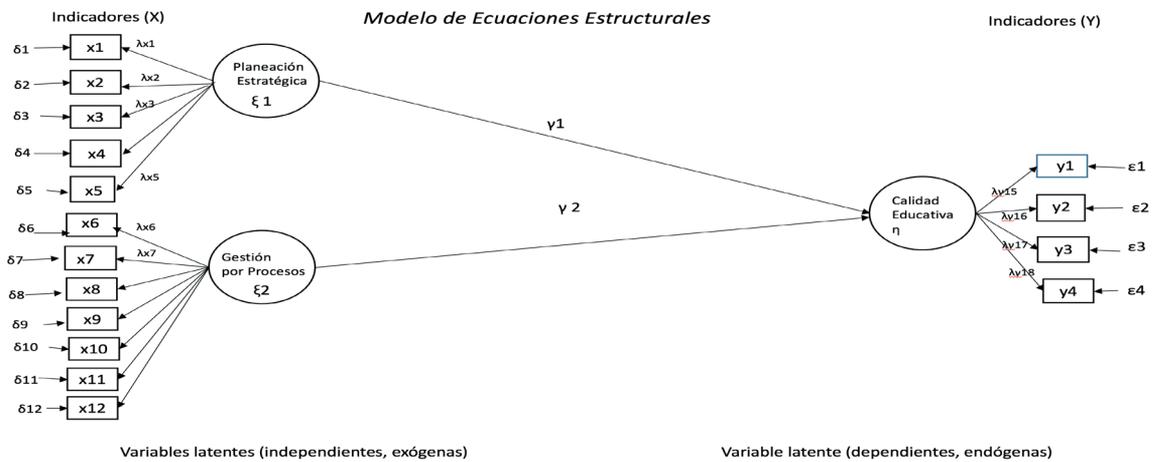
Reliability and construct validity

	Cronbach's alpha	rho_A	Composite Reliability	AVE
(VDCE)	0.919	0.929	0.945	0.814
(VIGP)	0.966	0.966	0.972	0.831
(VIPE)	0.967	0.971	0.975	0.885

Hypothesis testing is confirmed by applying the partial least squares (PLS) adjusted by structural equation method. This technique constructs research models based on theoretical concepts and derived in unobservable (latent) variables and empirical elements in indicators. By means of relationships, it is possible to present the hypo-

theses graphically, using trajectory diagrams, and the direction of the relationships of a latent variable can be determined in relation to its indicators. The Structural Equation model generated for this research (Figure 1) and the model generated in the SMART PLS software (Figure 2) are presented below.

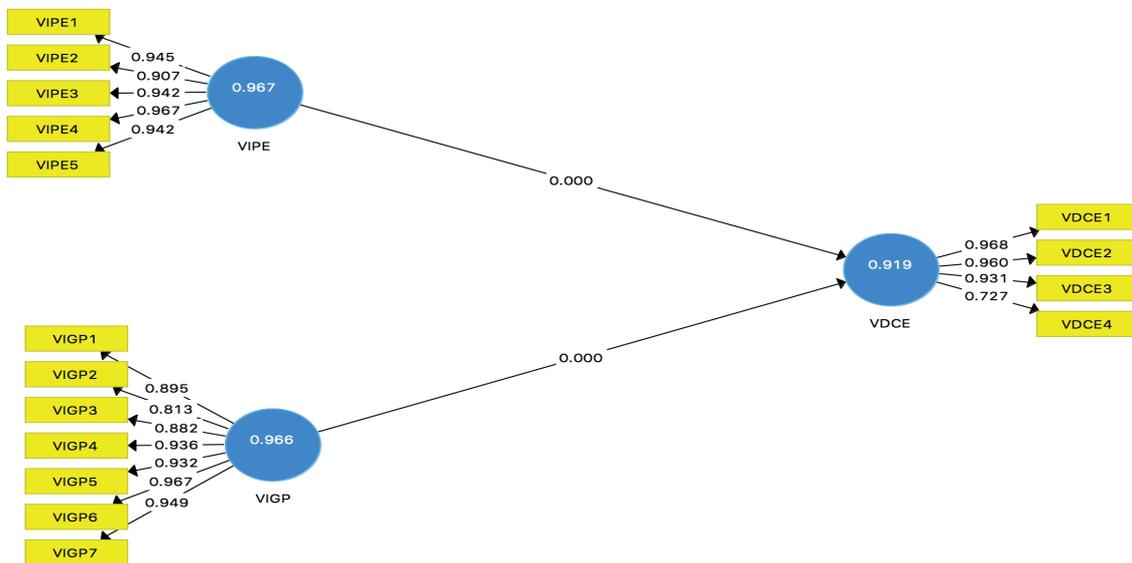
Figure 1
Structural equation model



As for the internal reliability, the parameter of each item was placed in a range from 0 to 1, so the values close to 0.70 mean a limit of

acceptability (Hair *et al.*, 2017). In summary, all 16 items show the acceptable values above 0.70 (Figure 2).

Figure 2
Internal reliability of the model



Note. Own elaboration based on Smart PLS software.

With the estimation of the path coefficients (Table 4) standardized in a range from + 1 to -1, it is verified that the higher the value, the greater

the relationship between constructs and the closer to 0, the less the prediction. The accepted value within the range is that corresponding

to VIGP-VDCE with 0, located in the range of $p < 0.05$. On the other hand, VIPE-VDCE presents a result of 0.504 located above the acceptable value. The significance level is determined with the re-sampling process, and tries to find the

standard error of the parameters, as well as the Student's t-values. Being able to obtain N set of samples, with n observations each one, it is intended to make a comparison with the hypotheses raised.

Table 4
Coefficientes path

	Original sample	Sample mean	Standard deviation	Statistics t	P values Sig
VIGP-VDCE	0.652	0.617	0.162	4.022	0 ($p < 0.05$)
VIPE-VDCE	0.107	0.146	0.16	0.668	0.504 ($p > 0.05$)

As for the estimation of F2 (Table 5), the participatory relationship of an independent variable in R2 of the dependent variable is considered. Cohen (1988, in Hair *et al.*, 2017 p. 271) establishes an evaluation to measure F2: 0.02, which means a small effect; 0.15 a medium effect and 0.35 a large effect. In that sense, the Strategic Planning variable (VIPE) contributes to a result of 0.009 in F2 and its effect is almost null

in Educational Quality, which is the dependent variable by being located below the value of 0.02. As for the Process Management variable (VIGP), it has more participation in the explanation of the dependent variable corresponding to the Educational Quality variable (VDCE) with a score of 0.328, corresponding to a large effect according to Cohen's valuation, as shown in Table 5.

Table 5
Determination coefficient of F2 of the constructs

Construct	Name	F2	Effect
Strategic Planning	VIPE	0.009	small
Process Management	VIGP	0.328	big

The results processed in the Smart PLS program are presented in Table 6 with each construct:

Cronbach's alpha, composite reliability, average variance extracted (AVE), F2, R2.

Table 6
Final model statistics

Construct	Cronbach's alpha	Composite reliability	AVE	F2	R2
VIPE	0.967	0.975	0.885	0.009	
VIGP	0.966	0.972	0.831	0.328	
VDCE	0.919	0.945	0.814		0.549

The independent variable Process Management (Table 7) shows a large and direct positive

effect on the variable Educational Quality with a correlation coefficient that based on Cohen's

valuation is 0.328. Likewise, the accepted value within the range is that corresponding to VI-GP-VDCE with 0, located in the range of $p < 0.05$

at the significance level; therefore, the hypothesis is confirmed as accepted.

Table 7
Testing hypothesis 1

Hypothesis	Relation	Proposed effect	F2	Effect	Statistics t	p Values	Significance level	Results
H1	VIGP-VDCE	positive	0.328	Big	4.022	0	<0.05	Accepted

Regarding the second hypothesis of this study, the independent variable which is the Strategic Planning (Table 8) presents a small effect on the variable Educational Quality, since

the F2 results are 0.009, placing it in that range. Its significance level is located as > 0.05 since it has a p-value of 0.504, so it is considered a rejected hypothesis.

Table 8
Testing hypothesis 2

Hypothesis	Relation	Proposed effect	F2	Effect	Statistics t	p Values	Significance level	Results
H2	VIPE-VDCE	positive	0.009	small	0.668	0.504	> 0.05	Rejected

Therefore, the research yielded that hypothesis 1 on the impact of process management variable on educational quality in HEIs is accepted. This is related with studies conducted by Irmayani *et al.* (2018). On the other hand, hypothesis 2 on the impact of strategic planning on the educational quality of HEIs is rejected, being consisted with the research of Hu *et al.* (2018) and Santamaría (2022) regarding the poor relationship of strategic planning on the educational quality of public institutions, given that they have public resources and defined budget items.

Conclusions and discussion

The changing environment faced by the public and private sectors increases the complexity of meeting the needs of stakeholders. In addition to the requirements of each institution, especially public institutions, it is essential to determine the relevance of integrating management systems (Cepeda and Cifuentes, 2019). Educational quality is related to terms of equity, efficiency, effectiveness, innovation, transformation, among others (Suasnabas Pacheco and Juárez, 2020). In

order to improve the quality of education and the educational system, educational evaluation represents a key tool to the extent that public policies are coherent with global, national and regional changes and education is relevant to them (Gil *et al.*, 2017).

The findings confirm UNICEF's (2019) studies for Latin America that emphasize the need to consider the context of HEIs in strategic planning for the development of an institution towards organizational quality. While it is possible through process management to decrease the level of bureaucracy by controlling and evaluating activities, institutional excellence is based on establishing strategies that respond to educational problems and needs, measured through achievable objectives (Madrigal and Calderón, 2017; Barbón and Fernández, 2018). It is required to analyze the context, identify opportunities for improvement to achieve the objectives as a result of proper planning, organization and monitoring (Ada, 2018).

In short, in order to achieve quality in education it is necessary, in addition to integrating and controlling processes, that these respond to the follow-up of goals and objectives derived from

a particular educational context. The results of the study indicate the contribution of the process approach to educational quality in the development of activities in HEIs, which must be aligned to an adequate strategic planning with particular goals and objectives for each institution. The reality of each institution requires certain strategies for achieving its objectives and, particularly in public HEIs, improving the teaching and learning, so that the relation of strategic educational management processes with the entire learning community is crucial to recover and improve school performance (Hernández and Miranda, 2020).

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