

Academic Management in Colombian Higher Education Institutions: Harmonization between NTC ISO 9001:2015 and Decree 1330 of 2019 for the Qualified Registration

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ABSTRACT:

This work characterizes the academic management process of a Colombian higher education institution within the framework of NTC ISO 9001:2015 and quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019, issued by Colombia Ministry of National Education for qualified registration. The research applied a qualitative, hermeneutic, documentary approach across three methodological moments: harmonization of requirements, documentation of procedures, and validation through internal audit. Researchers collected data from institutional records, participatory workshops, and process-leader interviews. Results show that 25% of ISO 9001:2015 requirements converge directly with the institutional conditions of Decree 1330. The strongest integration occurs in the Do phase of the PDCA cycle. The team documented three procedures: Academic Follow-up, Registration and Control, and Self-assessment. These operate in synergy through shared outputs such as the academic calendar. The internal audit covered five processes and identified 13 conformities, 11 nonconformities, and 14 recommendations. Academic Management accounted for the highest number of nonconformities, concentrated in academic software vendor controls and self-assessment culture. Harmonizing ISO 9001:2015 with Decree 1330 is technically feasible and gives technical-professional institutions in Colombia a replicable internal

reference. Sustained compliance, however, requires a stronger self-assessment culture and more staff training on the quality management system.

Keywords: academic management, quality assurance, higher education, process-based management, educational accreditation.

1. Introduction

Provide a brief review of relevant literature. Higher education institutions face profound, sweeping transformations driven by globalization, the internationalization of knowledge, and rapid technological change, which have reshaped both teaching strategies and evaluation processes in higher education (Hernández et al., 2025; Hernández et al., 2025; Navarro et al., 2026). Institutions also answer to growing demands from the productive and business sectors and to rising public expectations about academic quality. Academic programs in particular compete against a wide range of educational institutions and must satisfy the requirements of their stakeholders. These shifts move institutions away from traditional educational administration models and toward process-centered management models (Campaña-Lara et al., 2020), models built on sequences of steps that convert inputs into results and rest on continuous improvement, evidence-based decisions, and value creation for stakeholders. Institutions also face the challenge of sustaining high quality standards to meet the demand for competent, innovative global citizens who can respond to a changing society and labor market.

In this context, and particularly in Colombia, the state requires Higher Education Institutions (HEIs) to comply with legal norms and regulations that set the requirements, factors, and basic characteristics institutions must meet to offer academic programs and services of guaranteed quality. HEIs must also follow the international guideline on quality standards, specifically ISO 9001, which ensures compliance with requirements that support “planning, control, and improvement tied to a process structure” (Fontalvo Herrera et al., 2021, p. 46). HEIs therefore need to demonstrate results and impact, particularly in their academic programs,

which justifies adopting quality standards that certify favorable outcomes and contributions to the social and economic transformation of the environment where they operate.

This also means managing HEIs as an integrated system in which the substantive functions, teaching, research, and outreach, articulate strategically with mission-critical and support processes to strengthen a culture of organizational quality (International Organization for Standardization, 2015; Oakland, 2014). This applies not only to academic offerings and administrative management but also to the requirements and processes tied to program authorization through Qualified Registration (QR) and High-Quality Accreditation. Process-based management models thus underpin modern quality systems, widely applied across Colombian HEIs committed to optimizing their management and organizational performance in line with ISO 9001:2015, a standard that strengthens systemic administration through interrelated processes, reinforces leadership, builds understanding of the educational organizational context, embeds a risk-based, preventive mindset, and drives continuous improvement as the basis for sustainable results (International Organization for Standardization, 2015).

From this perspective, educational quality assurance systems respond to the need for relevance, transparency, and public trust, as UNESCO-IESALC (2022) confirms when it states that HEIs must build internal quality systems that integrate strategic planning, academic management, self-assessment, and continuous improvement through coordinated, reliable decision-making processes. In Colombia, the Ministry of National Education (MEN) regulates the Quality Assurance System and the Qualified Registration processes for both HEIs and their academic programs through Law 30 of

1992, Law 1188 of 2008, Decree 1075 of 2015, Decree 1330 of 2019, Decree 529 of 2024, and Resolution 21795 of 2020. These regulations address quality evaluation grounded in learning outcomes, curricular coherence, institutional self-regulation, and continuous improvement to strengthen internal quality assurance systems aligned with institutional management. Within the qualified registration and renewal process, quality conditions 1, 2, 3, and 4, covering denomination, justification, curricular aspects, and the organization of academic activities, are core components for demonstrating coherence between program identity, contextual needs, the graduate profile, learning outcomes, and the pedagogical strategies institutions implement (Ministerio de Educación Nacional, 2019). These conditions also serve as essential elements for evaluating how effectively academic management processes contribute to the institutional mission, without diminishing the importance of the remaining quality conditions the MEN defines through Decree 1330 of 2019 for Qualified Registration (QR) purposes.

The analysis above motivates this research, which aims to characterize the Academic Management process of a Colombian HEI within the framework of NTC ISO 9001:2015 and the program conditions the MEN defines for QR, specifically conditions one through four: denomination, justification, curricular aspects, and the organization of academic activities. The goal is to strengthen the quality culture and guide the institution's internal policies and directives. This characterization supports the standardization of processes in line with MEN requirements and NTC ISO 9001:2015 principles. It also serves as a tool to strengthen the integration between process management, academic activity, and MEN quality standards, and it contributes to the HEI's overall quality assurance. This responds to the question that emerged from analyzing the institution's situation: what basic structure integrates the legal requirements, the ISO 9001 standard, and quality conditions 1, 2, 3, and 4 established in Decree 1330 of 2019, issued by Colombia's MEN?

1.1. Scope, Contributions and Structure

The research follows a descriptive-interpretive, flexible, open-ended documentary scope, shaped by the study's overall context and its own conditions (Hernández Sampieri et al., 2014). It centers on the factors that characterize the Academic Management process of the HEI under study, within the framework of quality standards and MEN requirements for QR of the institution's academic programs. It describes and interprets processes and procedures through direct observation of the management process and physical review of institutional documentation, using distinct but complementary actions. It presents specific dimensions of the object of study within the analyzed context, covering the phenomenon itself, the actors involved, and the causes and settings where it takes place (Hernández-Sampieri & Mendoza Torres, 2018). It details the relationships and variables tied to the specific academic management process, which integrates the registration and control, academic management, and self-assessment procedures, to design the process based on applicable requirements drawn from ISO 9001:2015 and quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019. This research contributes to the academic management of the HEI studied in the following ways:

1. It offers a methodological strategy to interpret the institution's organizational processes coherently, through the identification of objectives, inputs, activities, responsibilities, resources, interactions, risks, controls, indicators, and results.
2. It provides a structured approach to improve academic management and address environmental challenges, benefiting students, faculty, administrators, and the institution as a whole.
3. It prioritizes the registration and control, academic management, and self-assessment procedures in the design of the corresponding process, grounded in the applicable requirements of ISO 9001:2015 and quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019.

4. It offers an institutional strategy to interpret the HEI's operation coherently, through the identification of its organizational processes, commitments, and responsibilities, available resources, internal and external interactions, risk levels, and management indicators and results.

2. Background

This work characterization of academic management at a Colombian HEI, within the framework of NTC ISO 9001:2015 and the MEN's QR conditions, starts from an internal situation at the institution: it failed to manage the documentation needed to renew the qualified registration of one of its academic programs. Under Colombia's higher education regulations, this left the program unable to admit new students and required the institution, under the same legal framework, to run a contingency plan to guarantee continuity and graduation for active students while preserving the validity of the degree and the MEN's quality conditions (Ministerio de Educación Nacional, 2015). Reflecting on this situation and the need to reopen the program, the institution identified difficulties integrating the requirements of ISO 9001:2015 with Decree 1330. This showed up in the documentation submitted to support the QR renewal, which was incomplete and failed to meet the requirements set by both regulations. The registration lapse immediately affected the dropout rate, which fell 60% institution-wide during the first academic semester, alongside a high staff turnover rate of 47% during 2023.

It is worth noting that QR is a mandatory, enabling requirement for MEN-recognized HEIs to offer and run academic programs in Colombian territory (Article 1, Law 1188 of 2008). It is the mechanism through which the State verifies and validates HEI compliance with the conditions set in Law 1188 of 2008 and Decree 1075 of 2015, to guarantee training processes with suitable, appropriate quality standards and to keep educational offerings running without interruption. The MEN defines

quality as “the set of interdependent, dynamic, articulated attributes the academic community builds as benchmarks that respond to social, cultural, and environmental demands” (Art. 1, Decree 1330 of 2019, p. 4), attributes that enable internal and external evaluations of HEIs aimed at “promoting their transformation and the ongoing development of their training, academic, teaching, scientific, cultural, and outreach work.” As Arango Salazar & Quintero Cristancho (2024) note, the concept of educational quality opens two paths: a pedagogical one tied to flexible, relevant, contextualized curricula, and an administrative one that requires evaluating and controlling institutional processes. Quality management, then, becomes a contribution of institutional leadership to public educational institutions.

On this subject, Mireles Rodríguez (2020) studied the implementation of an ISO 9001:2015-based management system at a Mexican public institution and found that quality-driven education must aim to challenge itself and compete for academic excellence. Morell-Alonso et al. (2021) similarly argue that higher education institutions need to recognize stakeholder needs before designing or updating academic programs, to guarantee high-quality offerings that respond to current environmental demands and to clarify how a program functions, how it interrelates, and what it contributes to these groups through quality standards. Fontalvo Herrera et al. (2021) designed an integrated quality management system for higher education academic programs in Colombia, analyzing legal requirements and defining a basic process structure to integrate the MEN's quality standards for the country's academic programs. Their analysis used documented information as the base instrument for gathering the data QR requires under Decree 1330 of 2019, ISO 9001:2015, and Resolution 021795 of 2020. They concluded that although these quality standards support the design of a Quality Management System (QMS), institutions still need, as Morell-Alonso et al. (2021) also argue, to understand stakeholder needs before designing or updating academic programs. This ensures the education offered stays relevant and

responsive to current demands, and it helps identify more precisely how a program operates and what it delivers to its stakeholders through quality standards integration. Recent international literature reinforces the relevance of this harmonization effort. Kayal & Khalife (2025) analyzed quality assurance practices at a Saudi Arabian institution and found that comprehensive documentation, monitoring, and evaluation procedures are positively associated with institutional rankings and international accreditation outcomes, underscoring that the operational rigor pursued in this study carries weight beyond the Colombian context. In the Latin American region specifically, Pacheco Barros et al. (2026) compared quality assurance systems across the region's higher education institutions and identified persistent differences in criteria, methodologies, and degrees of obligatoriness among national accrediting agencies, together with a growing influence of internationalization on the adoption of standards adapted to local contexts, a tension this study addresses directly by anchoring an international standard to a country-specific regulatory decree. Rincón Moreno & Gordillo-Ramírez (2025), in a systematic review of quality assurance processes in higher education, likewise stress that institutions still lack replicable, evidence-based standards for integrating quality frameworks into daily academic management, a gap the characterization and procedure documentation

presented here seek to narrow for professional technical HEIs. The characterization of Academic Management at the analyzed HEI, within the framework of NTC ISO 9001:2015 and the MEN's QR quality conditions, offers a coherent way to interpret the structure and development of HEI organizational processes in terms of their objectives, activities, responsibilities, resources, interactions, indicators, and results.

3. Methodology

The research follows a qualitative approach, built on a hermeneutic, descriptive-interpretive documentary design shaped by the study's overall scope (Hernández Sampieri et al., 2014). The unit of analysis is the academic management process of the HEI under study, a Professional Technical Institution under Law 30 of 1992 that offers two professional technical programs.

Data collection drew on authorized access to the institutional OneDrive, review of hard drives and emails, and participatory collaboration with process leaders through in-person work sessions and sessions on Microsoft Teams. At the start of the research process, the rector and the executive team held meetings to introduce the ISO 9001:2015 implementation as a strategic initiative led by senior management. Table 1 describes the stages, activities, and results the data collection process produced.

Table 1: Stages, activities, and results of the data collection process.

Objective	Research Stage	Activities	Outputs
Characterize the Academic Management process of an HEI within the framework of the NTC ISO 9001:2015 standard and quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019.	Stage 1	1. Harmonization of NTC ISO 9001:2015 requirements and quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019 2. Identify and list requirements mappable across both standards, and those not shared 3. Define the activities involved	1. Definition of mappable and non-common criteria 2. Characterization of the Academic Management process

			in the academic management mission-critical process
		4.	Characterization of an HEI's academic management process
		5.	Conclusions
		6.	Recommendations
Define the procedures an HEI needs to direct Academic Management toward high-quality accreditation processes.	Stage 2	1.	Planning and documentation of Academic Management procedures
		2.	Determine resources and competencies
		3.	Conclusions
		4.	Recommendations
			1. Documentation of procedures, instructions, and forms
			2. Indicators
Validate the procedures through an internal audit that evaluates the degree of compliance and defines the improvement plan.	Stage 3	1.	Plan the audit process
		2.	Execute the audit.
		3.	Audit report
		4.	Develop the improvement plan.
		5.	Conclusions
		6.	Recommendations
			1. Audit report
			2. Improvement plan

Note. Summary of research methods. Adapted from Torres et al. (2019).

The research unfolded across three methodological stages (Torres et al., 2019). Stage 1 harmonized the requirements of NTC ISO 9001:2015 with quality conditions 1, 2, 3, and 4 of Decree 1330 of 2019, identified the requirements mappable across both standards, and built the Academic Management Process Characterization Matrix using the Stakeholder Matrix, the SWOT Matrix, and CAME Analysis as tools. Stage 2 planned and documented the Academic Follow-up, Registration and Control, and Self-assessment procedures, together with the Controls Matrix and the Legal Requirements Matrix. Stage 3 ran the internal audit, applying evaluation criteria based on NTC ISO 9001:2015 and the conditions of Decree 1330. Master's students in Quality Management, certified auditors, carried out the audit and developed the corresponding improvement plan. Validity and reliability rested on communication traceability and the HEI's validation of deliverables. Data triangulation combined three independent sources, institutional records retrieved from the

OneDrive repository and hard drives, direct observation during participatory work sessions, and process-leader interviews, so that a requirement or procedure was documented only once at least two sources converged on the same finding, following the triangulation logic Hernández-Sampieri & Mendoza Torres (2018) describe for qualitative documentary research. To mitigate researcher bias, the harmonization matrix and the procedure drafts went through iterative review cycles with the process leaders and the rector's executive team before being taken as final, which let the people who owned each process correct misinterpretations the research team might have introduced during document analysis. Credibility was further supported by peer debriefing among the Master's-level auditors during Stage 3, and by an audit trail that kept dated records of each work session, matrix version, and validation meeting, allowing the analysis to be traced back to its original sources. The indicators used were the proportion of integrable requirements by stage of

the continuous improvement cycle (Plan-Do-Check-Act, PDCA) and the proportion of non-integrable requirements by the same stage. The working hypothesis held that the HEI's academic management process functions as an internal reference point, built as a mission-critical process in the process map to maintain and expand programs with active qualified registrations.

4. Results

4.1. Harmonization of NTC ISO 9001:2015 requirements and Decree 1330 of 2019

The institutional quality conditions selected from Section 3 of Decree 1330 converged with 25% of the ISO 9001:2015 requirements under the standard's high-level structure. In the Plan phase, three requirements aligned: the quality management system and its processes match the institutional features that support regulatory, academic, teaching, scientific, cultural, and outreach work (Article 2.5.3.2.3.1.1, Decree 1330). Integration proved strongest in the Do phase, where four requirements aligned, covering resource provision for the QMS, staff competency management, and documented information, which correspond to the Institutional Architecture (Article 2.5.3.2.3.1.3, item d) and the faculty selection and evaluation mechanisms (Article 2.5.3.2.3.1.2, item b) of Decree 1330. In the Check phase, two requirements aligned: monitoring, measurement, analysis, and evaluation matched the Self-assessment Culture (Article 2.5.3.2.3.1.4, Decree 1330), since the institution needs an internal quality assurance system that self-assesses

management, use of information, and academic outcomes. In the Act phase, Management Review connects to the administrative structure and the Institutional Educational Project (PEI). This harmonization defined the documentation the HEI needs to maintain the traceability required when filing renewal or new qualified registration documents.

4.2. Characterization of the academic management process

The Academic Management Process Characterization Matrix, shown in Table 2, was built with input from process leaders across the Administrative and Human Talent Management office, Academic Direction, Student Welfare, the Rector, and Institutional Planning. It draws on section 0.3.1 of NTC ISO 9001:2015, which covers the general process approach and encourages managing HEI activities as interconnected processes that function as a system. Its purpose is to achieve predictable results and improve efficiency, which raises stakeholder satisfaction by consistently meeting their requirements. The matrix follows the PDCA cycle, shown in Figure 1. The process objective is defined as meeting the needs of the student community throughout their academic training, while ensuring quality management of the administrative and regulatory procedures within the academic programs. The scope begins with identifying the community's training needs, moves through student graduation, and ends with improving training outputs in compliance with MEN regulations and educational quality conditions.

Table 2: Activities in the characterization matrix, Plan, Do, Check, and Act phases.

Phase	Activities	Outputs
PLAN	▪ Diagnose the needs of the productive sector and community at large	▪ Identification of training needs
	▪ Define the program offering	▪ Offering of new and existing programs
	▪ Build the academic programs	▪ Master Document
	▪ Approve the program's qualified registration	▪ Approved program
DO	▪ Project schedules for the academic term and assign the budget line	▪ Assigned schedules and resources
	▪ Parameterize the academic software; publish the offering; register	▪ Report of admitted students; assigned schedules and resources;

	applicants; select admitted students; manage financial enrollment; process academic enrollment; verify and cancel courses; run leveling and intersession courses; evaluate per the academic calendar ▪ Approve the call for faculty applications; publish the call; register faculty applicants; select candidates; hire faculty ▪ Plan teaching load; define the activity schedule; review teaching load planning; register teaching load in the software; review and approve teaching load in the software ▪ Schedule theoretical and/or practical activities; plan own resources per academic term; plan and deliver classes; hold student advising sessions; prepare exams; administer exams; grade, communicate, and publish grades; prepare and administer remedial exams; publish remedial exam grades; validate intersession or leveling courses ▪ Plan faculty evaluation; evaluate teaching performance; evaluate research and social outreach for probationary faculty; evaluate academic-administrative faculty; analyze faculty evaluation results; evaluate faculty training ▪ Discuss, review, and approve the program's denomination, justification, curriculum design, and financial feasibility study ▪ Draft program-creation agreements and the curriculum approval agreement; draft the qualified registration document and the program's educational project for new programs; deliver the products Planning requires ▪ Analyze context and stakeholders; identify and assess risks and opportunities ▪ Study document creation, modification, or elimination and carry out the corresponding review and approval	report of enrolled students; extended grade record ▪ Hired faculty; document management ▪ Approval of teaching load assignment in the academic software ▪ Work plan; class attendance control; advising attendance; grade communication; validation records ▪ Faculty evaluated on compliance with substantive functions ▪ Meeting minutes ▪ Filing of the master document and supporting materials in Colombia's Ministry of National Education platform for qualified registration filings ▪ Approved process risk and opportunity map ▪ Minutes approving documents for validation
CH EC K	▪ Handle internal and/or external audits ▪ Collect and measure indicators	▪ Findings ▪ Action plan follow-up

	Attend control and follow-up meetings	Improvement and change management plans
ACT	Execute corrective actions and risk-control and improvement actions, under the responsibility of the quality committee	QMS follow-up records (meeting minutes and supporting documents)

Note. Activities per the PDCA cycle. Adapted from the high-level structure of de Castillo Pineda (2019).

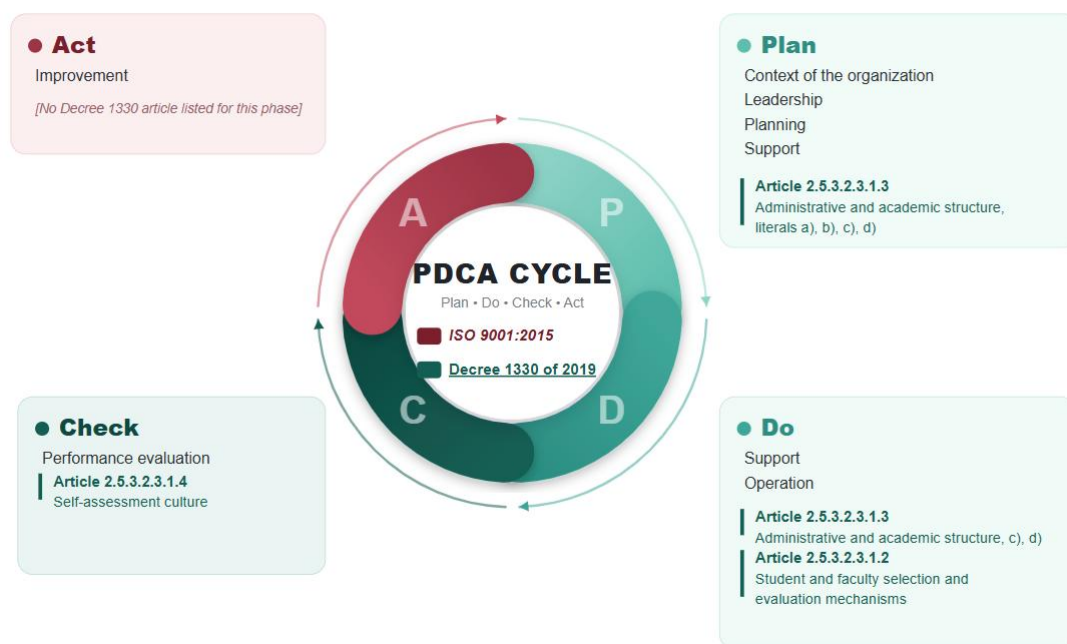


Figure 1: Deming PDCA Cycle

Note: Adapted from the Deming methodology proposed by Suárez Vásquez & Zeña Ramos (2021).

The Plan phase included activities such as diagnosing needs in the productive sector, defining the program offering, building academic programs, and securing qualified registration approval. The Do phase covered student admission, schedule projection, faculty assignment, planning and execution of the academic calendar, faculty evaluation, and qualified registration management. The Check phase included handling audits, measuring indicators, and monitoring action plans. The Act phase defined the execution of corrective and improvement actions as the responsibility of the quality committee.

4.3. Documentation of academic management procedures

The Academic Follow-up procedure focuses on monitoring and supporting the academic community to evaluate academic performance,

identify problems, and propose improvements. It begins with a meeting among the Rectory, Planning, Student Welfare, and Academic Direction to define the preliminary schedule and build the academic calendar. The team also designed a Microsoft Forms survey for graduates as a replicable model for measuring user satisfaction, applicable across different processes.

The Registration and Control procedure is the most extensive and cross-cutting. It covers returning-student enrollment renewal, course and faculty load projection, faculty selection and hiring (from the call for applications through contract signing), faculty and student induction on the Q10 Académico and Microsoft Teams platforms, and execution of the 16 academic weeks. Student induction covers the presentation of the PEI, the organizational structure, student regulations, rights and duties, and verification of

platform access to all courses, running two to three days depending on student load.

The Self-assessment procedure draws on the outputs of the two previous procedures, the academic calendar, the student roster, and the faculty roster, and evaluates satisfaction across both populations through surveys administered via Q10 Académico on a five-level scale: 1-Deficient, 2-Insufficient, 3-Acceptable, 4-Outstanding, and 5-Excellent. The self-assessment coordinator compiles, tabulates, and analyzes the results, delivers the self-assessment report to the quality committee, and presents conclusions and recommendations to the Rectoría to schedule the corresponding improvement actions.

4.4. Validation through internal audit

The audit covered five processes: Academic Management, Institutional Planning, Human Talent Management, Institutional Follow-up and Improvement, and Physical Infrastructure and ICT Management. The documented findings totaled 13 conformities, 11 nonconformities, and 14 recommendations. Academic Management showed the highest number of nonconformities (six), followed by Institutional Follow-up and Improvement (three), Institutional Planning (one), and Human Talent (one). Infrastructure Management recorded conformities only.

Among the most notable conformities in the Academic Management process, under the requirements of Decree 1330, the audit verified: semester planning through records such as the academic calendar and course-faculty scheduling (requirement 8.1/Article 2.5.3.2.3.1.1, Decree 1330); the active qualified registration of the Professional Technical Program in Mobile Device Programming, National Higher Education Information System (SNIES) code 108421 (item 8.2.2); student and faculty induction controls with attendance records and class monitoring (requirement 8.5); verified graduation requirement documentation in Registration and Control (requirement 8.6); and faculty selection with induction sessions, schedule assignment, calendars, and course content (Article 2.5.3.2.3.1.2, item b, Decree 1330/2019).

Within this same framework of Decree 1330 of 2019, the nonconformities identified in Academic Management included: no record of controls over nonconforming outputs such as faculty shortages (item 8.7.2, Decree 1330); student enrollments dated after the qualified registration's expiration (January 28, 2023), breaching item 8.2.3; missing payment records in student files (item 7.5.3); attendance records with blank, unfilled fields (item 7.5.3); gaps in the planning, inputs, controls, and outputs of curriculum design (item 8.3 of the same decree); no defined requirements or controls for the Q10 academic software vendor (item 8.4); no validation of graduation requirements (item 8.6); missing documented information on changes to the academic calendar and welfare plan (item 8.5.6); faculty regulations lacking tenure criteria (Article 2.5.3.2.3.1.2); and no self-assessment culture to validate follow-up on mission-critical objectives (Article 2.5.3.2.3.1.4). The resulting improvement plan includes corrective actions with root-cause analysis and closure activities.

5. Discussion

The harmonization results show that 25% of the ISO 9001:2015 requirements converge directly with the institutional conditions of Decree 1330 of 2019, with the Do phase showing the strongest integration. This finding aligns with Fontalvo Herrera et al. (2021), who also found that the quality standards in Decree 1330 and ISO 9001:2015 support an integrated QMS design for Colombian academic programs, though they stressed the need to understand stakeholder needs beforehand. The 25% integration rate suggests that, despite complementarity between the two frameworks, the non-shared requirements represent improvement opportunities HEIs must manage according to their legal nature and program type.

Regarding the documented procedures, the Q10 academic software emerged as a critical element for automating tasks and workflows in academic management, enrollment, follow-up, schedule generation, and stakeholder communication. The audit found, however, that the institution had not defined requirements or controls for this vendor

relationship (item 8.4 of the standard). This matches Orozco A. et al. (2020), who argue that a well-structured QMS needs documented processes and a culture of continuous improvement, including control over external vendors that directly affect service delivery.

The finding about the limited self-assessment culture, which produced a direct nonconformity against Article 2.5.3.2.3.1.4 of Decree 1330, stands out as one of the study's most significant results. Núñez Naranjo (2020) notes that QMS frameworks serve as pillars for building a solid documentary base that supports monitoring quality-related projects and helps meet indicators and targets while avoiding rework. The analyzed HEI had made progress toward obtaining qualified registration as a discrete goal but failed to sustain compliance with the requirements over time, a warning other HEIs implementing similar systems should heed.

The audit process also revealed a relevant cultural factor: HEI leaders and support staff had historically treated audits as a search for errors meant to blame staff. The team addressed this perception through a thorough explanation before the audit began, which points to a broader need for training in quality culture, as Miño de Gauto (2021) argues when linking institutional rework directly to delays in QMS implementation. This shows that human buy-in and ownership of the QMS matter as much as the documents and records the system produces.

Placed alongside other quality assurance models in the region, the harmonization framework proposed here shows both continuity and novelty. Pacheco Barros et al. (2026) found that Latin American accrediting agencies diverge substantially in their evaluation criteria and in how binding their requirements are, which makes cross-border transfer of any single national model difficult; the present study responds to that constraint by working directly from an international standard, ISO 9001:2015, rather than from another country's accreditation model, and mapping it onto Colombia's own regulatory decree. This differs from the approach Kayal & Khalife (2025) documented for a Saudi Arabian

institution, where quality assurance practices were built primarily to satisfy international ranking and accreditation bodies; the HEI examined in this study instead prioritized internal continuity of a single academic program after a registration lapse, which explains why the harmonization matrix emphasizes operational procedures over external positioning. Even so, both studies converge on the same structural conclusion, that documentation consistency and internal audit routines are what sustain quality outcomes over time, which suggests the 25% convergence rate found here is not an idiosyncrasy of the Colombian case but part of a broader pattern across national quality assurance systems.

Finally, the results of the characterization and procedure documentation offer a replicable internal reference for other professional technical HEIs in Colombia. The proposed harmonization between ISO 9001:2015 and Decree 1330 of 2019 provides a concrete methodological path that, as Pineda Molina et al. (2021) note, strengthens academic management and improves institutional positioning by combining the standard's requirements with the decree's. Future research could evaluate the impact of fully implementing the improvement plan on the process's performance indicators and on the institution's qualified registration renewal rate.

6. Conclusions

Harmonizing NTC ISO 9001:2015 with the institutional conditions of Decree 1330 of 2019 is technically feasible and provides a documented reference for designing the academic management process at professional technical HEIs. 25% of the standard's requirements converge with the decree's conditions, with the Do phase showing the strongest integration, indicating that operational support, resources, competencies, and documented information form the connecting thread between both frameworks.

Characterizing Academic Management at a Colombian HEI, within the framework of NTC ISO 9001:2015 and the MEN's qualified registration quality conditions, ranks among the

most important and time-intensive steps in designing HEI management systems. It requires consensus from the executive team, participation from process actors, and tools such as benchmarking against other national institutions to broaden the expected outcome's scope. The legal requirements tied to the process, in this case Decree 1330 of 2019, must connect directly to the design from the outset, since they shape the documentation the renewal or new qualified registration requires.

The three documented procedures, Academic Follow-up, Registration and Control, and Self-

assessment, work in synergy: the schedule and academic calendar are the outputs that link Follow-up to Registration and Control, and both feed into Self-assessment. Insufficient staff training on the QMS and a limited self-assessment culture stand out as structural causes that block identification of rework and improvement areas, and they represent the main challenges to sustaining the system over time. Delivering the educational service efficiently and effectively is a shared responsibility between leaders and staff, since everyone bears responsibility for ensuring the process outputs meet stakeholder expectations.

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