

Strategies for Successful Accreditation in Engineering Programs: Lessons Learned from Institutional Practice

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Abstract— *The accreditation of engineering programs is a critical mechanism for ensuring academic quality and alignment with professional standards. However, managing the simultaneous accreditation of multiple programs presents significant organizational and operational challenges. This paper presents a case study of the coordinated reaccreditation of four engineering programs under the criteria of the Consejo de Acreditación de la Enseñanza de la Ingeniería (CACEI). The proposed approach is based on a centralized–collaborative governance model that integrates structured planning, standardized tools, and continuous coordination while preserving academic ownership at the program level.*

The methodology includes the use of common reporting templates, a shared institutional timeline, and regular coordination meetings to ensure alignment and consistent progress across programs. Additionally, targeted strategies were implemented to address challenges such as faculty workload and fragmented evidence systems, including the consolidation of documentation into a centralized repository and the provision of continuous training for stakeholders.

The effectiveness of the approach is reflected in the accreditation outcomes: all four programs obtained the maximum six-year accreditation period awarded by CACEI, along with a reduction in identified weaknesses compared to previous accreditation cycles. These results suggest that the integration of centralized coordination with distributed academic responsibility can improve process efficiency, consistency, and institutional alignment. The findings contribute a scalable model for managing multiple accreditation processes in higher education institutions.

Keywords—Accreditation Process, Higher Education, Academic Quality, Educational Innovation, Engineering Education

I. INTRODUCTION

The accreditation of engineering programs constitutes a quality assurance measure, the implementation of which is intended to ensure that the program's stated outcomes are consistently achieved. This formal validation process involves the evaluation of academic programs according to standards that have been verified by regulatory and professional bodies. Accreditation serves as a formal certification that ensures the fulfillment of specific criteria and standards established by the relevant profession and industry. This accreditation serves to ensure that the program's components align with the established requirements and expectations, thereby maintaining the program's relevance and validity in the current and future

professional landscape. These elements encompass curriculum quality, content, intended learning outcomes, staff experience, and available resources and infrastructure [1,2,3].

In the context of higher education institutions, the process of program accreditation typically entails an internal self-assessment, conducted by the institution's personnel, followed by an external evaluation by a team of qualified specialists from industry or academia. This predetermined process utilizes standards to evaluate quality, with these standards representing conditions and specifications established by accreditation agencies in collaboration with beneficiaries and stakeholders of the academic program. These standards adhere to both national and international norms.

It has been posited by certain authors that the objective of program accreditation is to enhance academic standing, caliber, and standards of higher education courses or institutions. This process is accomplished by providing impartial confirmation that these institutions can produce qualified, skilled, and job-ready graduates. The process of accreditation bestows upon universities an international legitimacy and credibility by establishing quality standards and research guidelines that must be met [4,5,6,7]

Consequently, accreditation has emerged as a pivotal instrument for ensuring that engineering education programs adhere to global standards, enhance student employability, and augment the institution's prestige. This process is fundamental to ensuring the quality, relevance, and continuous improvement of engineering programs worldwide [8-10]. In addition to demonstrating compliance with external standards, accreditation processes require institutions to align their academic practices, governance structures, and evidence-based decision-making at various organizational levels. This complexity increases significantly when multiple programs are involved, especially in institutions with several campuses or those coordinated nationally.

While much of the existing literature on accreditation focuses on compliance requirements, assessment practices, or outcomes-based education, less attention has been paid to the institutional management of simultaneous accreditation processes. In practice, institutions often face challenges related

to coordination, faculty workload, evidence fragmentation, and alignment between national and campus-level decision-making. These challenges call for deliberate management strategies rather than ad hoc responses.

This paper presents a case study of how one institution coordinated the simultaneous CACEI accreditation (Accreditation Council for Engineering Education, A.C.) of four engineering programs over a one-year cycle. The experience is analyzed not only in terms of documentation produced, but also in terms of governance, planning mechanisms, collaboration, and continuous improvement practices that enable the process to be effectively managed. The study highlights strategies that contributed to success, contextual factors that facilitated implementation, and key challenges encountered along with their mitigation.

II. LITERATURE REVIEW

A. Relevance of accreditation processes for universities

All universities continually update and improve their curricula, guided by government regulations and the increasingly complex demands of a constantly changing environment. The environment is influenced by a multifaceted array of factors, including technological advancements, environmental concerns, public health and welfare, economic dynamics, and international interactions among countries and societies. Higher education institutions are obligated to adhere to the government education policies of each nation to confer valid and accredited diplomas for professional practice. Furthermore, it is imperative that they incorporate the demands of the environment into their respective curricula. This integration ensures that the curricula remain pertinent and capable of addressing complex contemporary problems and even creating different and superior realities [12].

To ensure the quality of curricula, their relevance to both current and future needs, and the efficiency and effectiveness of educational processes in training young professionals with soft and disciplinary skills, national and international organizations have been developed to define, safeguard, and endorse compliance with these standards. The common goals of national and international accreditation bodies include the following:

- The enhancement of educational standards throughout the nation is imperative.
- The promotion of student mobility is of paramount importance.
- The institution has a mission to contribute to the country's development by training qualified individuals and professionals who contribute to organizations and society [13]

In this context, accreditation in higher education becomes an essential process that seeks to guarantee the quality of both

institutions and their respective programs. Accreditation in engineering programs is of particular relevance for several reasons.

- a) Firstly, the primary purpose of the accreditation process is to ensure that educational institutions meet the quality standards established by recognized bodies. This guarantees that students receive a high-quality education. The evaluation of accredited programs is conducted from various criteria, including curriculum, resources, faculty, and learning outcomes. This multifaceted approach ensures a robust foundation for the training of competent engineers.
- b) Secondly, accreditation serves to enhance academic and professional mobility by facilitating the recognition of degrees from accredited programs on both a national and international level. This is of particular importance in a globalized world where engineers may seek employment in different countries.
- c) Similarly, accreditation has been demonstrated to contribute to the continuous improvement of educational programs, thereby promoting a culture of evaluation and constant updating. This approach is designed to ensure that the program remains at the forefront of technological advancements.
- d) Finally, accreditation has the potential to enhance an institution's reputation, thereby attracting high-quality students and enabling collaborations with other institutions and companies.

Consequently, this can result in increased opportunities for research and development. Considering this considerable impact, it becomes imperative to comprehend the complexities inherent in the effective management of accreditation processes [14,15].

The objective of the research is to explore how an institution can effectively manage the simultaneous accreditation of multiple engineering programs. This exploration will be achieved by examining the coordination, governance, planning mechanisms, collaboration, and continuous improvement practices involved.

The central question guiding this study is how institutions can effectively coordinate and manage simultaneous CACEI accreditation processes for multiple engineering programs. To address this question, the study will examine the strategies, contextual factors, and challenges that play a critical role in this process.

III. ACCREDITATION MANAGEMENT APPROACH

Our university has 20 campuses across the country. This study was conducted at the main campus, which enrolls approximately 17,000 undergraduate students. Of this

population, 7,426 students belong to the School of Engineering and Sciences, distributed across 18 engineering programs. This research presents a case study of the accreditation process of four engineering programs over a one-year cycle, highlighting institutional practices aimed at establishing, documenting, and sustaining academic processes aligned with national quality standards. The four engineering programs are:

- IC - Civil Engineering
- IFI – Industrial Physics Engineering
- IMD – Biomedical Engineering
- IMT – Mechatronics Engineering

The selection of these four programs was driven by their accreditation cycles, as all were approaching the end of their three-year validity period in 2025. Unlike the remaining 14 engineering programs, which either held active five-year accreditations or were undergoing curriculum restructuring and name changes, these four programs maintained consistent academic identities. This stability ensured the availability of coherent historical evidence, making them the most suitable candidates for a simultaneous reaccreditation process. Furthermore, this selection provided an opportunity to implement and evaluate a scalable accreditation management model that could be extended to other programs in future cycles.

CACEI is a non-profit organization responsible for establishing quality standards for the accreditation of engineering education in Mexico (<https://cacei.com.mx/>). CACEI is internationally recognized through its membership in the Washington Accord (WA), a multilateral agreement that promotes substantial equivalence among accredited undergraduate engineering programs worldwide (<https://www.internationalengineeringalliance.org/accords/washington-accord>). CACEI’s evaluation system relies on volunteer peer reviews, engineering professionals and academics from different disciplines who are committed to strengthening the quality of engineering education in the country. Faculty members from our university actively serve as evaluators and participate in accreditation processes at other institutions, contributing to a culture of continuous improvement and shared academic responsibility.

Managing the simultaneous accreditation of multiple engineering programs requires not only technical compliance with standards, but also a coherent institutional approach that aligns people, processes, and structures over time. Over a one-year cycle, the institution implemented a coordinated management model to prepare four engineering programs for CACEI accreditation. This approach prioritized alignment, consistency, and efficiency across programs while fostering meaningful participation from academic and administrative stakeholders. It combined structured planning, standardized tools, continuous coordination, and institutional capacity

building to support a unified preparation for the CACEI site visit.

A. Overall Process

The accreditation effort unfolded through a sequenced set of activities that evolved from institutional preparation to final external evaluation. The complete process flow is summarized in Fig. 1

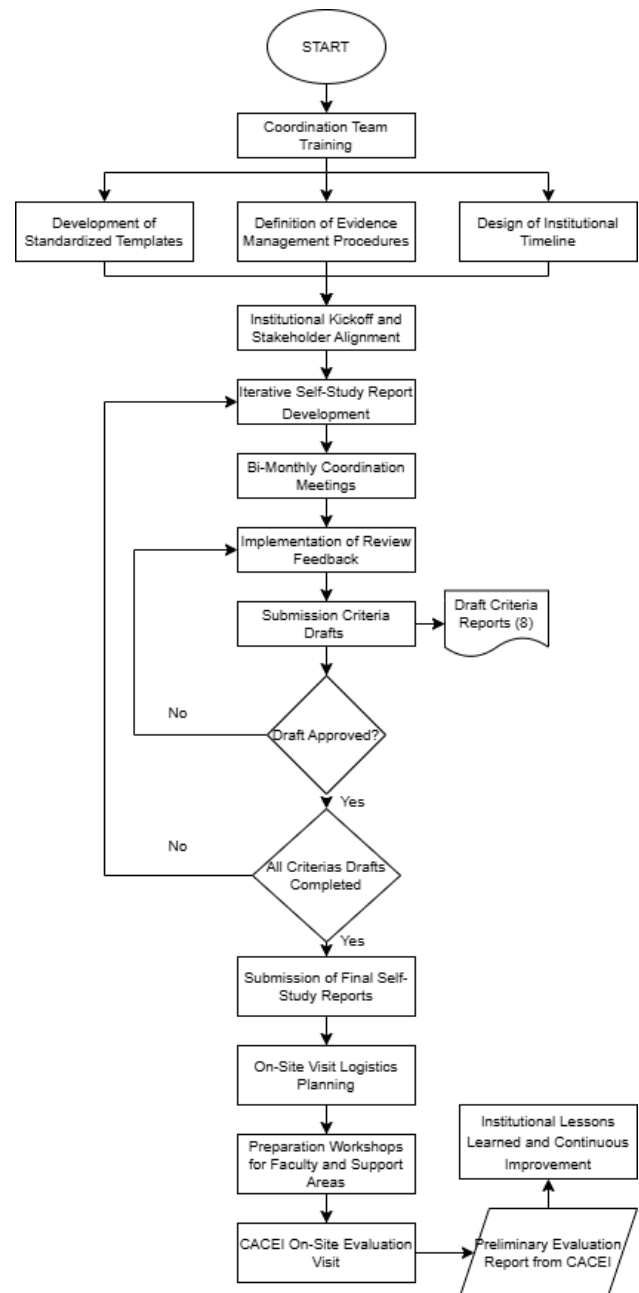


Fig 1. Institutional accreditation process flow for simultaneous preparation of four engineering programs

Prior to the formal launch of the process, the Accreditation Coordination Team engaged in approximately two months of structured preparation, which included targeted training with CACEI and the development of internal tools such as standardized templates, evidence management procedures, and a shared institutional timeline aligned with national curricular baselines. This initial work created a solid foundation that enabled subsequent coordination with academic and administrative stakeholders.

The process was then formally initiated through a campus-wide kick-off meeting that convened Program Directors, Department Directors, faculty, and representatives from institutional support areas. This meeting focused on building shared understanding, clarifying roles at national and campus levels, and aligning stakeholders around a common accreditation strategy. Because preliminary planning had already taken place, the kick-off emphasized engagement and coordination rather than basic organization.

Following this alignment phase, the institution entered an extended period of iterative self-study development. During this time, the Accreditation Coordination Team led continuous drafting, review, and refinement of the CACEI self-study reports for all four programs, while coordinating systematic evidence collection, internal reviews, and ongoing alignment between national guidelines and campus implementation. Regular bi-monthly meetings with each program supported consistent progress and collaborative problem-solving.

The cycle culminated with the CACEI on-site evaluator visit. In the weeks preceding the visit, the coordination team conducted final validation activities, verified the completeness of evidence in the centralized repository, aligned program narratives with institutional practices, and coordinated logistics with support areas. This sequence of activities demonstrated the feasibility of a coordinated institutional approach to simultaneous accreditation.

B. Guiding Principles of Methodology

The accreditation management methodology was grounded in three guiding principles:

1. Unified coordination with distributed responsibility, whereby a central coordination team managed the overall process while each program retained ownership of its academic evidence and improvement actions.
2. Standardization of tools and processes, enabling comparability, efficiency, and coherence across the four programs.

3. Cross-functional collaboration, integrating academic, administrative, and institutional support areas into a coordinated institutional effort.

These principles shaped planning, execution, communication, and monitoring activities throughout the accreditation cycle. As illustrated in Fig. 1, effective simultaneous accreditation depended on the interaction of coordinated governance, standardized processes, and cross-functional collaboration. When any of these elements was absent, institutional alignment weakened and the complexity of managing multiple accreditation processes increased.

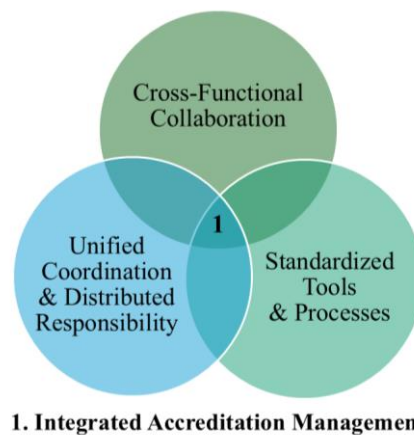


Fig 2. Guiding principles of the accreditation management methodology

C. Governance Structure and Roles

The accreditation process was managed through a multi-level, centralized–collaborative governance model, in which a single coordination team led the process while academic programs and institutional support areas maintained shared responsibility for evidence generation and compliance with CACEI criteria. This structure sought to balance consistency across programs with local academic ownership.

The Accreditation Coordination Team acted as the backbone of the process, responsible for overall planning, standardization of tools, progress monitoring, and alignment among stakeholders.

At the national level, the National Program Director played a strategic role by establishing the curricular baseline, defining common academic guidelines, and ensuring alignment of program learning outcomes across all campuses where the program is offered. This role provided the foundational framework upon which campus-level accreditation activities were built, promoting consistency and institutional coherence nationwide.

Each of the four engineering programs was led locally by its respective Program Director, who held primary

responsibility for campus-level academic leadership and final decision-making regarding curricular alignment, evidence preparation, and compliance with CACEI criteria at that campus. The Program Director served as the key liaison between national guidelines and local implementation.

Working in close coordination with the Program Director, the Department Director acted as the chief academic authority over faculty. The Department Director coordinated faculty participation, ensured that all faculty-related documentation was properly prepared and organized, and validated evidence associated with teaching, assessment, and academic performance.

The functions of assessment and continuous improvement were integrated within the Accreditation Coordination Team, which assumed responsibility for supporting the interpretation of indicators, mapping of learning outcomes to CACEI criteria, and documentation of improvement cycles across the four programs. By consolidating these roles into a single team, the institution ensured coherence between evidence generation, data analysis, and decision-making throughout the accreditation process.

In parallel, multiple institutional support areas, including library services, mentors, data management, academic services, and administrative units, contributed official evidence, reports, and logistical support required for the accreditation process, strengthening institutional readiness and cross-functional collaboration.

Table 1. Governance Structure for simultaneous accreditation

Level	Role	Main Responsibilities	Contribution to Accreditation
National	National Program Director	Define curricular baseline; align learning outcomes across campuses	Ensures national consistency and academic coherence
Campus Coordination	Accreditation Coordination Team	Plan accreditation process, monitor progress, support assessment and continuous improvement	Provides centralized coordination and ensures alignment across programs
Program Level	Program Directors	Prepare evidence; ensure compliance with CACEI criteria; make final academic decisions	Connect national guidelines with local implementation

Faculty Leadership	Department Directors	Coordinate faculty participation; validate faculty-related documentation; oversee academic evidence	Ensures accuracy and completeness of faculty evidence
Faculty	Faculty Members	Provide course-level evidence, implement assessment practices support continuous improvement actions	Supply primary academic evidence for accreditation
Institutional Support Areas	Library, Mentors, Data Management, Academic Services, Administrative Units	Provide institutional reports, statistics, documentation, and logistical support	Enable cross-functional collaboration and institutional readiness

D. Planning and Coordination Mechanisms

Rather than relying solely on a calendar schedule, the accreditation effort was governed by a set of institutional planning and coordination mechanisms that structured collaboration, ensured accountability, and supported steady progress across all four programs. These mechanisms translated the overall timeline into actionable practices at national, campus, and program levels.

Central to this framework was a shared institutional timeline, which established common milestones for evidence submission, internal reviews, and final validation activities. This timeline functioned as a coordination instrument that aligned the work of Program Directors, Department Directors, and institutional support areas while enabling the Accreditation Coordination Team to monitor progress and anticipate risks in advance.

A key operational mechanism was the use of regular bi-monthly coordination meetings for each program. These meetings followed a standardized structure in which participants reviewed progress against milestones, identified evidence gaps, assigned responsibilities, and tracked improvement actions. This consistent cadence created a predictable rhythm of collaboration, strengthened communication among stakeholders, and enabled real-time problem solving across programs.

In parallel, the Accreditation Coordination Team implemented institutional capacity-building activities to strengthen readiness for the CACEI evaluation. Instead of formal mock visits, targeted training sessions were conducted with academic leaders and support areas to clarify accreditation expectations, sensitize participants to the purpose of the

process, and align understanding of the evaluator visit. Training materials, including presentations and guidelines, were hosted in a dedicated Microsoft Teams channel to ensure shared access, transparency, and continuity of knowledge across the institution.

In the final weeks prior to the site visit, planning mechanisms shifted toward validation and logistics. The coordination team led a structured review of the centralized evidence repository, verified completeness and consistency of documentation, aligned program narratives with institutional practices, and coordinated operational arrangements with support areas. These activities ensured institutional coherence and readiness for the external evaluation.

These planning and coordination mechanisms operationalized the accreditation strategy, transforming a high-level timeline into a collaborative, accountable, and continuously monitored process across all four programs.

IV. FINDINGS

After completing a full one-year cycle of simultaneous accreditation preparation for four engineering programs and concluding the CACEI site visit, several recurring lessons emerged regarding how accreditation was effectively managed at the institutional level. The experience showed that success depended not only on high-quality documentation, but also on how the process was organized, how responsibilities were distributed, and how stakeholders worked together over time.

Based on this experience, the findings are organized around three dimensions: (A) deliberate strategies that proved critical for success, (B) contextual factors that enabled effective implementation (“what worked well”), and (C) key challenges encountered and the actions taken to address them.

A. *Strategies for Success*

The successful simultaneous accreditation of the four programs was supported by a coherent set of mutually reinforcing management strategies rather than isolated actions. These strategies combined structured planning, standardized tools, and consistent communication while preserving program-level ownership of academic decisions.

A centralized accreditation coordination team served as the operational backbone of this approach, providing a unified framework for the process. By consolidating planning, assessment, documentation, and ‘closing-the-loop’ responsibilities into a single entity, the institution eliminated departmental silos and ensured a standardized interpretation of CACEI criteria. This centralized hub managed communication across national and campus-level stakeholders, streamlining the

flow of evidence and facilitating rapid problem resolution throughout the accreditation cycle.

The use of standardized templates for all four programs was equally critical. Common formats for self-study reports, evidence mapping, and improvement plans created a shared language across programs and reduced variability in how information was presented. This standardization streamlined internal reviews, clarified expectations for Program Directors and Department Directors, and minimized the need for repeated revisions.

A shared institutional timeline further strengthened coordination. The common schedule established clear milestones for drafting, evidence submission, internal quality checks, and final validation activities. This allowed the coordination team to balance workloads more effectively, anticipate risks in advance, and maintain steady progress across all programs. The timeline also reinforced collective responsibility, as all programs advanced toward the same institutional milestones.

Finally, regular bi-monthly coordination meetings per program created a predictable rhythm of collaboration. These meetings enabled continuous monitoring of progress, timely identification of evidence gaps, and joint decision-making among the Accreditation Coordination Team, Program Directors, and Department Directors. Over time, this consistent cadence fostered transparency, accountability, and proactive problem-solving.

Taken together, these strategies constituted a structured management framework that made it feasible to coordinate multiple accreditations simultaneously without compromising quality.

B. *Enablers of Success*

Beyond the intentional strategies described above, several contextual and relational factors significantly enabled their effective implementation.

A strong culture of collaboration at the campus level proved fundamental. Academic and administrative stakeholders demonstrated shared commitment to the accreditation objectives, which facilitated cross-functional cooperation and reduced resistance to additional responsibilities. This collaborative environment encouraged openness, collective problem-solving, and alignment between individual and institutional priorities.

Continuous communication and trust among Department Directors, Program Directors, and the Accreditation Coordination Team were also decisive. Regular, transparent dialogue allowed concerns to surface early and be addressed

constructively, while mutual respect strengthened working relationships across roles and levels. This trust-based dynamic supported sustained engagement over the year-long process and facilitated timely adjustments when issues arose.

In addition, ongoing training activities contributed to institutional readiness and shared understanding of accreditation expectations. Targeted sessions helped sensitize academic leaders and support areas to the purpose and importance of CACEI accreditation, clarify evidence requirements, and promote consistent practices across programs. Hosting training materials in a dedicated Microsoft Teams channel further supported knowledge sharing and accessibility.

C. Challenges and Mitigation

Despite the overall effectiveness of the accreditation, two challenges persisted throughout the accreditation cycle: faculty workload and fragmented evidence systems. Rather than undermining the process, these challenges prompted adaptive responses that strengthened institutional practices.

The increased faculty workload associated with accreditation activities was the most persistent concern. Faculty were required to generate, organize, and validate documentation while maintaining their regular teaching and administrative responsibilities. To mitigate this pressure, several complementary actions were implemented:

1. Clearer and more standardized templates reduce uncertainty and rework.
2. Responsibilities were more explicitly distributed among the Accreditation Coordination Team, Program Directors, and Department Directors.
3. Continuous training clarified expectations and streamlined evidence preparation; and
4. Sustained collaboration with Department Directors provided ongoing support for faculty teams.

These measures did not eliminate workload entirely, but they significantly improved its manageability and helped sustain faculty engagement.

A second challenge involved evidence scattered across multiple institutional systems and platforms, which involved retrieval and consolidation. To address this, the Accreditation Coordination Team was explicitly tasked with collecting, consolidating, and translating relevant data into usable formats for the self-study reports. Acting as an intermediary between institutional data sources and program leadership, the team ensured that Program Directors received coherent, validated, and accessible evidence aligned with CACEI criteria. The use of a centralized evidence repository further improved traceability and reduced duplication.

Overall, the way these challenges were addressed reinforced by an institutional learning cycle. Instead of treating difficulties as obstacles, the institution used them to refine coordination mechanisms, clarify roles, and strengthen data management practices, enhancing its capacity for future accreditation processes.

IV. CONCLUSIONS

The accreditation of engineering programs is most effective when structured planning, standardized tools, and consistent communication are integrated, while maintaining academic ownership at the program level. This study demonstrates that the management of multiple simultaneous accreditation processes can be significantly strengthened through a centralized coordination team that serves as the operational backbone of the process.

The effectiveness of this approach is reflected in the final accreditation outcomes. All four participating programs—Civil, Industrial Physics, Biomedical, and Mechatronics Engineering—obtained a six-year accreditation period, the maximum duration awarded by CACEI under the current 2025 Framework [16]. This represents a notable improvement compared to previous accreditation cycles. In addition, a comparative review of the final evaluation reports revealed a reduction in "Weakness" observations relative to prior independent accreditation efforts. Stronger compliance was observed in criteria related to continuous improvement, as the centralized coordination team ensured that closing-the-loop evidence—specifically the documentation of how assessment data informed curricular changes—was systematically documented with greater transparency and traceability.

Compared to traditional accreditation processes, which are often managed independently at the program level, the approach presented in this study emphasizes centralized coordination combined with distributed academic ownership. To address common challenges such as faculty workload and fragmented evidence systems, targeted measures were implemented, including the use of standardized templates, the explicit distribution of responsibilities among key stakeholders, and the consolidation of evidence into a centralized repository. These actions improved workload manageability while strengthening institutional alignment and consistency across programs.

While these findings are derived from a single institutional context, the underlying principles of centralized coordination, standardization, and cross-functional collaboration are broadly applicable. The model is designed to be adaptable to other universities regardless of resource constraints, as it prioritizes process alignment over high-cost infrastructure.

Looking forward, future work should focus on consolidating accreditation as a continuous improvement ecosystem rather than a periodic compliance exercise. This includes the further integration of institutional data systems to reduce manual evidence consolidation, the formal evaluation of faculty workload distribution during accreditation cycles and the development of mechanisms to support them, and the definition of performance indicators to assess the long-term impact of accreditation on student outcomes and program innovation. These efforts would contribute to transforming accreditation into a strategic, data-driven process that supports sustained program quality and institutional learning.

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