

QUALITY ENHANCEMENT POLICIES OF HIGHER EDUCATION COMMISSION AND THEIR IMPACTS ON UNIVERSITIES: A COMPARATIVE STUDY OF PUBLIC AND PRIVATE UNIVERSITIES IN SINDH

Salahuddin Shaikh^{*1}, Prof. Dr. Saima Kamran Pathan²,
Prof. Dr. Noor Muhammad Jamali³, Prof. Dr. Hakim Ali Mahesar⁴

Corresponding Author: *

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ABSTRACT

This research paper investigates the impact of the Higher Education Commission's (HEC) quality assurance program, specifically the role of the Quality Enhancement Cell (QEC) and the Accreditation Council, in improving logistics and academic outcomes in public and private universities in Sindh, Pakistan. The study adopted a quantitative research design using data collected through a close-ended questionnaire based on a 7-point Likert scale with 212 respondents, government and Private universities accounted for half. SPSS is used for Descriptive Statistics (eg ANOVA, T-test), while Smart PLS is used for Structural Equation Modeling (SEM). The analysis focuses on the effectiveness of QEC and accreditation councils in improving university infrastructure, curriculum development, faculty performance, and student outcomes. The findings highlight differences in the impact of quality assurance practices between public and private institutions, providing insights for policy improvements and university operations. The study highlights the importance of developing individualized strategies to improve quality assurance in higher education and highlights the need for continuous improvement, faculty development and harmonization of global standards.

INTRODUCTION

In recent years, the quality of higher education has become a key to human capital development and national competitiveness (Metro, 2007; Meek et al., 2009). In January 2005, the Higher Education Commission established the Quality Assurance Agency (QAA) to improve the quality of education across the country. Along with this, Quality Improvement Units (QECs) were systematically introduced in public and private universities. These QECs, in partnership with the Higher Education Commission's QAA, seek to align Pakistani universities with international academic quality standards (Iqbal et al., 2023; Riaz & Qureshi, 2007). Despite these efforts, the country still faces challenges, with only 3% of the population aged 17-23 enrolled in higher education (Murtaza and Hui, 2021). The effectiveness of these initiatives depends on the balance between internal and external quality assurance mechanisms (McGhee, 2021). As Pakistan continues to reform its higher education system, it is

critical to integrate strong internal quality assurance processes with external standards to promote continuous improvement and meet global standards (Azeem et al., 2021.; Perveen et al., 2021).

Organizational Background

By generating experts and leaders who uplift society, higher education contributes significantly to its progress (Mustard, 1998). Even though higher education is important, Pakistan has historically neglected education, and as a result, the country's education spending accounts for only 2.9% of GDP, a small amount compared to the 4-6% recommended by UNESCO (UNESCO Organization, 2021). In order to evaluate how Quality Enhancement Cell (QEC) projects are being implemented in six Pakistani public and private universities that were chosen at random, this study looks at how these initiatives are meeting international standards and improving academic quality (HEC, 2022; Batool &

Qureshi, 2019). This study aims to evaluate QEC's efficacy in raising educational standards and offer suggestions for future policy advancements.

University Of Sindh

Established in 1947, Sindh University is one of the oldest universities in Pakistan. Initially an examination institution, it became a teaching institution in 1951 to meet the shortage of teachers in the country. In the mid-20th century, the university moved to Jamshoro and expanded its academic fields to include the humanities and sciences. Today it has 43 departments.

A major development took place in 2006 when the Higher Education Commission (HEC) established Quality Enhancement Cells (QECs) in universities. QEC is committed to improving the quality of education and ensuring it meets national and international standards. Responsibilities include monitoring educational programs, conducting internal and external evaluations, and promoting continuous improvement. By collaborating with other institutions and adapting to global best practices, QEC helps Sindh University to maintain competitive standards, improve the university's status and improve Pakistan's higher education system as a whole.

Sindh University's commitment to quality assurance not only benefits its staff and students but also sets an example for other institutions in Pakistan.

Shah Abdul Latif University Khairpur

Named for the Sufi poet Shah Abdul Latif Bhitai, Shah Abdul Latif Institution (SALU) Khairpur was founded in 1976 and became a public institution in 1986. The institution was founded as a Sindh University campus to supply higher education to the northern region of Sindh. Currently, 28 departments and centers on Carpool's 302-acre campus serve a varied student body across several faculties, including Arts and Languages, Natural Sciences, Social Sciences, and Law (SALU, 2021).

The Higher Education Commission (HEC) launched the University's Quality Enhancement Cell (QEC) in 2006 to raise educational standards and bring them into compliance with global norms (HEC, 2022). In addition to conducting external reviews, internal audits, and self-evaluation programs, QEC also prioritizes teacher development by offering training

sessions and seminars. Through his initiatives, SALU has gained reputation on a national and international level and enhanced curriculum, research output, and student happiness. The university's research and employment capacities are further enhanced through collaboration with other institutions and industry (SALU, 2021; HEC, 2022).

Iqra University, Karachi

Iqra University Karachi is a prestigious private university renowned for its brilliance in research and education. It was founded in 1998 by Huneed Lakhani. The institution now offers a variety of courses in engineering, media science, computer science, teaching, and fashion design in addition to its original focus on business administration. It has multiple campuses; the main one is in Defense View, Karachi, and provides cutting-edge resources for both academic and individual growth (Iqra University, 2021).

Through self-evaluation and adherence to national and international accrediting standards, the University's Quality Enhancement Cell (QEC), as directed by the Higher Education Commission (HEC), plays a crucial role in preserving academic standards (HEC, 2022).

Notable accomplishments of Iqra University include strong graduate employment rates and both national and international accreditation. To increase its scholarly production and inventiveness, Iqra University also fosters a research culture and hosts conferences and seminars (Iqra University, 2021). Iqra University's dedication to providing high-quality education has allowed it to maintain its position as one of Pakistan's leading universities even as it expands.

Shaheed Zulfikar Ali Bhutto Institute Of Science And Technology (Szabist)

Ms. Benazir Bhutto established the Shaheed Zulfikar Ali Bhutto Institute of Science and Technology (SZABIST) in Karachi in 1995 as a memorial to her father, Shaheed Zulfikar Ali Bhutto. With campuses presently located in Islamabad, Larkana, Hyderabad, and Dubai, SZABIST is approved by the Higher Education Commission (HEC) (SZABIST, 2021). With an emphasis on academic excellence and innovation, SZABIST is furnished with contemporary facilities and provides

a variety of courses in management science, computer science, media science, law, engineering, and biological sciences (SZABIST, 2021).

Per HEC criteria, SZABIST's Quality Enhancement Cell (QEC) was founded to guarantee ongoing academic progress through workshops, faculty development initiatives, and self-evaluation (HEC, 2022). Program evaluations are regularly overseen by QEC to ensure compliance with international standards and industry trends. Due in large part to its solid academic standing and the employability of its alumni, SZABIST has attained considerable respect on a national and worldwide scale (SZABIST, 2021). To further improve the Institute's research output, QEC also promotes a vibrant research culture through conferences and seminars (SZABIST, 2021). SZABIST's dedication to high-quality instruction and research has secured its dominant position in Pakistan's higher education market.

Preston University

Preston University was first founded in 1984 as a business school and has since grown to be one of Pakistan's most prestigious private universities. The university has added subjects including business administration, computer technology, engineering, and social sciences to its curriculum as part of its commitment to academic achievement (University of Preston, n.d.). Preston Institution, the country's first private institution, is well-known for its vast campus network and dedication to promoting academic excellence and personal and professional development via cutting-edge instruction (Preston University, n.d.). Preston University's visionary leadership and unwavering dedication to excellence, together with its focus on social development, are helping to define the future of higher education in Pakistan (Preston University, n.d.).

Research Gap

The Higher Education Commission's (HEC) quality improvement initiatives are intended to raise the standard of higher education in Pakistan; however, when contrasting their effects on public and private universities, especially in Sindh, There is still a research void. Although studies by other researchers, such (Riaz & Qureshi, 2007), indicate that the introduction of Quality Improvement Cells (QECs) has benefited education in general, they

examine the industry fairly and point out that private schools lack special expertise. Concentrate on. Research on quality assurance practices also lacks regional comparative analysis (Stensaker & Harvey, 2020; Newton, 2020; Meek et al., 2009; Knight, 2007). By comparing the effects of HEC rules on Sindh's public and private institutions, this research will close this gap and offer suggestions for better policy implementation in various learning environments.

Problem Statement

The influence of the Higher Education Commission's (HEC) Quality Enhancement Cell (QEC) major efforts to improve higher education on Sindh's public and private universities is still unknown. There's not much comprehension. Although HEC interventions have improved overall, their precise effects on various types of institutions are still being studied (Riaz & Qureshi, 2007). By evaluating the efficacy of QEC in Sindh's public and private universities, highlighting particular possibilities and problems, and offering suggestions for focused policy changes, this study will close this gap.

Research Aim and Objectives

To analyze and evaluate the quality improvement policies implemented by the Higher Education Commission (HEC) and their impact on universities, focusing on comparing the experiences of typical public and private universities in Sindh.

Objectives:

- i. Evaluation of the impact of quality improvement policies introduced by the Sindh Higher Education Commission (HEC) on public universities.
- ii. To assess the impact of the Sindh Higher Education Commission (HEC) quality improvement policies on private universities.
- iii. Comparing and contrasting the effectiveness of quality improvement policies in public and private universities
- iv. Identify the challenges and opportunities faced by universities in implementing HEC's quality improvement policies.

Significance Of The Study

This research is significant for some reasons. It starts with evaluating the success of the policies set forth by the Higher Education Commission (HEC) for

Sindh's public and private universities, outlining the advantages and disadvantages of the current educational framework (Riaz & Qureshi, 2007). This study compares these institutions to give policymakers information on how to close educational disparities in the area and enhance quality assurance tactics.

Second, the results offer fact-based suggestions for future policy enhancements targeted at creating more all-encompassing plans to cater to the needs of varied colleges (Meek et al., 2009; Knight, 2007). This is especially crucial in Sindh, a province with a severe education disparity.

The study also looked at questions of access and equity, comparing the outcomes of private institutions—which might be more expensive but may have greater resources—with public universities, which frequently serve lower socioeconomic groups (Stensecker & Harvey, 2020). The purpose of this comparison is to close the gap and guarantee that everyone has access to high-quality education.

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Research offers higher education institutions insight into efficient quality assurance procedures, assisting them in standardizing successful tactics and avoiding typical mistakes (Newton, 2020). By offering a sophisticated comprehension of empirical data and policy consequences, it advances the scholarly literature on quality assurance in education.

Scope of the study

This research aims to investigate the variables that enhance academic performance and logistics in higher education, with a particular emphasis on infrastructure, technological integration, resource allocation, and management procedures (HEC, 2022). Research looks at the quality initiatives that universities are currently doing, such as faculty development, internal quality assurance systems,

student support, and research programs (Riaz & Qureshi, 2007).

Furthermore, this study compares the implementation of these policies at public and private institutions in Sindh and looks at how they affect curriculum development, teaching methods, and academic performance in higher education (Meek et al., 2009; Knight, 2007). Effectiveness and performance at universities can be increased by highlighting possibilities, problems, and best practices in this comparison analysis. This research aims to offer perspectives and suggestions for enhancing compliance with higher academic standards and optimizing university operations.

Limitations

To determine the effects of the Quality Enhancement Cell (QEC) program on student practices and university administration, this study compares three public and three private institutions in Sindh. This study was restricted to these six schools due to time and financial constraints to thoroughly investigate how QEC influences academic standards, administrative performance, and student experience (HEC, 2022).

Administrators, teachers, and students' opinions were gathered for this study through a combination of qualitative and quantitative methods, including as surveys, interviews, and data analysis. This strategy will expose the advantages and disadvantages of current methods by highlighting the variations and parallels in the application and efficacy of QEC in public and private colleges. The purpose of these studies is to offer insightful suggestions for enhancing QEC procedures and bolstering Sindh's higher education system (Riaz & Qureshi, 2007) (Mack et al., 2009; Knight, 2007).

Literature review

The study discusses the alignment of higher education with local and global goals to foster cross-cultural communication and global perspectives (Ahmad & Hussain, 2020; (Qureshi & Khawaja, 2021); (Khan & Abbas, 2021). It emphasizes the importance of academic quality in social and economic progress (UNESCO, 2020; World Bank, 2021; OECD, 2022) and highlights the role of the Higher Education Commission of Pakistan (HEC) in regulating and improving education since 2002 (Fazal, 2019). Quality assurance, influenced by

stakeholder expectations, involves continuous improvement in educational services (Deming, 1986; Newton, 2022). Globalization enhances intercultural competence, and HEC policies have strengthened faculty development and research, though issues with fair access remain (Ahmad & Ahmed, 2023).

Quality Assurance in Higher Education

Originating in the 1950s in the Western industrial sector, quality assurance in higher education has developed into a complete framework with an ongoing focus on improvement (Bounds, 1994; Dale, 1990). To assist firms in meeting and surpassing set standards, it consists of methodical procedures including quality control, training, and strategic planning (Knight, 2003; Carley & Waldron, 1984). To provide accountability to all stakeholders, including the government and society, this approach emphasizes the significance of planned action to maintain and improve learning standards (Segers & Dochy, 1996; Frazer, 1994). In higher education, performance is investigated through continuous evaluation and the application of metrics that align with the objectives of the institution (Warren & Tranter, 2001; Birnbaum, 2000). However, institutional autonomy may be jeopardized by a centralized quality assurance strategy (Dade & Campbell, 2007). Managing and assessing stakeholder feedback, staff development, and course design are all included in quality assurance (Skilbeck, 2001; Meade & Woodhouse, 2000).

Regular evaluation and collaboration are crucial for quality assessment, according to international organizations like UNESCO and INQAAHE (UNESCO, 2021; INQAAHE, 2018). Under criteria for competition and transparency, OECD nations have been implementing national quality plans since the 1990s (Al-Khawas, 2001; OECD, 2020). Requiring that procedures be simple, flexible, and compliant with quality standards (Van Vught & Westerheijden, 1994). To improve educational results, recent literature suggests using stakeholders and technology (Ahmed & Hussain, 2022; Khan & Abbas, 2021). According to S Shaikh, 2024 in his studies indicated that, the challenges faced by various students have been categorized by following four categories: (1) general living adjustment, such as adjusting to food,

living/housing environment and transportation, dealing with financial problems and health care concerns; (2) academic difficulties, such as lack of proficiency in the English language Method of Teaching Problems (3) socio-cultural difficulties, for example, experiencing culture shock, Recreational Problems (4) personal psychological adjustment, such as experiencing homesickness, loneliness, depression, feeling isolation and worthlessness. Teaching methods and student outcomes have improved in Pakistan as a result of the Higher Education Commission's focus on faculty development, research, and infrastructure to raise the quality of education; however, issues with equitable access still exist (Ahmed et al., 2022; Pakistan Higher Education Board (Education, 2022). To effectively address the needs of global education, quality assurance necessitates ongoing adaptation and stakeholder collaboration (European Association for Quality Assurance in Higher Education, 2021; Ahmed & Ahmed, 2023).

Quality Assurance in Pakistani Universities

Improving Pakistan's higher education standards is key to developing a knowledge-based economy and remaining globally competitive. The Higher Education Commission (HEC) works to harmonize education and research with international standards. Its Quality Assurance Agency (QAA), established in 2004, plays a central role in this and the Quality Enhancement Cell (QEC) has been extended to 30 universities to strengthen training and education policy.

HEC also addresses administrative and financial challenges by establishing research centers, offering doctoral scholarships, and ensuring quality and capacity building through partnerships with international institutions such as the World Bank and UNESCO. These efforts aim to improve the quality of higher education in Pakistan and meet global needs.

Quality Assurance Committee

In 2003, the Higher Education Commission (HEC) of Pakistan established a committee to harmonize national and international standards in higher education. This resulted in the establishment of Quality Assurance Departments (QADs) and Agencies (QAAs) responsible for developing the

accreditation framework and monitoring quality standards.

These institutions have significantly advanced quality assurance through the development of policies, assessments, and self-assessment manuals that have helped institutions improve their curricula. Their efforts have resulted in more certification programs and improved academic outcomes. Additionally, HEC has initiated training programs to enhance the professional knowledge of teachers and promote a culture of academic excellence.

QAD and QAA play an important role in improving higher education in Pakistan through global collaboration and continuous development.

Quality Assurance Agency (QAA)

The Quality Assurance Agency (QAA) was established under the Higher Education Ordinance 2002 and has been functioning since 2005 and has played a key role in improving the quality of higher education in Pakistan. It recognizes monitoring bodies and strengthens their capacity to improve evaluation through the University's Quality Enhancement Cell (QEC).

Key responsibilities of the QAA include:

- Develop cross-departmental quality control procedures.
- Develop internationally competitive standards for higher education.
- Monitor QEC through audits and feedback.
- Leverage resources and training to build institutional capacity.

QAA has improved the quality of education and added certification courses. It is also known for innovative quality assurance practices, teacher development and global partnerships that help align Pakistan's education standards with international norms. This framework has greatly improved the level of higher education and promoted social and economic development.

Quality Enhancement Cell (QEC)

The Higher Education Commission (HEC) Quality Improvement Framework (2023) lays the foundation for quality control in higher education in Pakistan in line with international best practices. It is based on nine principles: autonomy, shared interests, fact-based decision-making, process focus, leadership, public engagement, customer focus and continuity.

These principles ensure systematic quality assurance at the national and internal levels.

Quality Assurance Agencies (QAAs) and Quality Improvement Cells (QECs) play a key role in maintaining these standards, with 210 QECs across the country contributing to quality improvement through self-assessment. Ongoing research is needed to develop a quality assurance model suitable for Pakistan, while collaboration with UNESCO and the World Bank can help improve the level of accreditation and align higher education in Pakistan with global standards.

Quality Assurance And Quality Enhancement

Performance control, according to the Quality Assurance Agency (QAA), involves making sure that arrangements at universities live up to expectations (QAA, 2004). Within institutional limits, quality management aims to achieve continual and effective improvement through professional assurance enhancement and learning opportunities (QAA, 2006). There is disagreement about whether quality assurance (QA) and quality enhancement (QE) are complementary or incompatible because the term "enhancement" in university auditing is open to several interpretations (Swinglehurst, 2008).

Quality assurance and quality assessment are viewed differently by scholars. According to Middlehurst (2008), quality assurance and quality evaluation are two different things, and sometimes they conflict with the objectives of development. Quality assurance does not always lead to quality assessment. Biggs (2007) makes a distinction between prospective quality assurance, which aims to continuously improve performance, and retroactive quality assurance, which is focused on fulfilling past standards. Transparency, agreement, and continuous internal evaluation—which includes student input and frequent course revalidation—are necessary for effective professional assessment (Harvey & Williams, 2010).

Quality Enhancement Cell Categories

Universities are ranked by the Higher Education Commission of Pakistan (HEC) according to how well they meet the financial, intellectual, and infrastructure standards (HEC, 2007). The "W" category does not indicate the highest grade, as is

commonly believed; rather, it represents the minimal standard of the degree-granting institution (HEC, 2011). Colleges are further ranked within this category as W-1 through W-4, with W-4 being the highest ranking (Express Tribune, 2011). According to the Daily Times (2011), institutions that don't meet these requirements are categorized into X, Y, or Z categories, which represent different levels of failure.

For instance, colleges in Sindh that met the requirements, such as Aga Khan University and Iqra University, received a "W" grade. By contrast, DHA Sofa University was rated 'Z' and East Hyderabad

University was rated 'Y' (Daily Times, 2011). Universities in lower categories were given an ultimatum to improve or face closure (Daily Times, 2011).

In order to raise ranks and maintain its competitiveness in the worldwide market, HEC revised its requirements by 2023 to incorporate technological integration, sustainability, and creative teaching techniques (HEC, 2023). The goal of this ongoing development is to assist Pakistan's socioeconomic growth while raising the standard of higher education.

Table 1 Universities/Institutions meeting all minimum criteria requirements

Category 'W':	Universities/Institutions meeting all minimum criteria requirements
Category 'X':	Universities/Institutions with minor shortfalls
Category 'Y':	Universities/Institutions not meeting the requirements
Category 'Z':	Universities/Institutions seriously deficient

Role of the HEC in Quality Assurance

The Higher Education Commission's development objective is challenged by Pakistan's higher education institutions' subpar quality control, which falls short of international norms (HEC). Strong internal quality control systems are essential since institutions frequently fail to meet international requirements.

Leadership, teacher productivity, student satisfaction, and market response are critical performance factors. The difficulties of progress are further increased by obstacles including insufficient elementary and secondary education, poor communication skills, and an unstable socio-political environment (HEC, 2023).

HEC used a multifaceted approach to address these problems:

1. Improving Teacher Training: Professional development courses, workshops, and possibilities for additional education are among the initiatives (HEC, 2023).

- 2. Enhancing Facilities:** Upgrade the facilities by making investments in cutting-edge labs, research centers, and classrooms (HEC, 2022).
- 3. Improving the Learning Environment:** fostering academic integrity and provide required materials (HEC, 2021).
- 4. Curriculum Development:** The curriculum is modified frequently to reflect changes in both industry and education (HEC, 2023).
- 5. Addressing Governance Issues:** bolster administrative frameworks and raise accountability and openness (HEC, 2022).
- 6. Assessment and Accreditation:** To preserve quality, implement certification and assessment programs (HEC, 2023).

The Quality Assurance Agency (QAA) of HEC is crucial to the creation and execution of quality framework audits. In order to improve graduate employability and worldwide competitiveness, recent revisions have concentrated on integrating technology, sustainability, and creative teaching methods (HEC, 2023).

Factors of QAA of HEC Pakistan

The Higher Education Commission (HEC) of Pakistan ensures the quality of universities through two main initiatives:

1. Quality Enhancement Cell (QEC): QEC supports academic, research and administrative processes by developing quality control procedures, conducting internal evaluations, promoting faculty development, and aligning academic programs with industry requirements. Harmonizes and strengthens. They promote transparency and continuous improvement to help universities meet international standards.

2. Accreditation Commission: This commission evaluates universities based on strict criteria, including faculty qualifications, course relevance, and infrastructure. Accreditation ensures that courses meet international standards, enhances institutional credibility and provides external verification of quality.

Together, QEC and the Accreditation Board are important in bringing the quality of education in Pakistan up to international standards.

Relationship of QEC as Factor of QAA of HEC, Pakistan with Logistic and Academic Improvement in Universities

The Higher Education Commission (HEC) of Pakistan's Quality Assurance Agency (QAA) includes the Quality Enhancement Cell (QEC), which is a crucial component that contributes to the academic and administrative advancement of the university. Through frequent assessments, QEC focuses on improving buildings, infrastructure, and management procedures to identify requirements like modernizing labs, growing libraries, and simplifying administrative procedures (HEC, 2023). To increase operational effectiveness and enhance the learning environment, they collaborate closely with university administration on strategy planning, resource allocation, and monitoring (Khan et al., 2021).

Hypothesis 1: An efficient QEC at a university is favorably correlated with better logistics, which in turn improves facilities, infrastructure, and administrative procedures.

QEC improves teaching, learning, and research at the University in addition to providing logistical support. To raise academic standards, they support

curriculum assessment, teacher development, and innovative pedagogy (HEC, 2023). In addition, QEC keeps an eye on performance metrics including student outcomes and research output. Data-driven analytics are used to identify and manage academic difficulties like faculty training and curriculum revisions (Rasheed et al., 2020).

Hypothesis 2: Academic progress is favorably correlated with a functional QEC in institutions, which enhances research production, student learning outcomes, and teaching quality.

In conclusion, fostering overall institutional development depends critically on the interaction between QEC and academic advancement, university logistics, and academic improvement. QEC contributes to the development of an educational environment that fosters student achievement and academic excellence by concentrating on academic quality and logistical improvements.

Relationship of Evaluation form Accreditation Council as Factor of QAA of HEC, Pakistan with Logistic and Academic Improvement in Universities

For Pakistani universities to maintain their standards and quality, accreditation boards' evaluations are crucial. This evaluation looks at technology, library resources, and infrastructure, among other areas of institutional logistics (HEC, 2022). Based on these evaluations, universities receive comments and recommendations for enhancements that direct upgrades like modernizing labs or growing library holdings to satisfy global standards (Ali et al., 2021).

Hypothesis 1: Higher infrastructure, facilities, and resources are among the logistical changes that colleges with good accreditation board ratings are more likely to implement.

Academic development activities at the university are also influenced by the Accreditation Commission's review procedure. Evaluations of academic programs, instructional strategies, student learning results, and research findings are frequently included in accreditation reviews (HEC, 2022). Academic standards, program relevance, faculty competency, and student participation are the criteria used to evaluate universities. Initiatives for educational improvement are sparked by the

accreditation committee's comments and suggestions following the evaluation process. Accreditation input is used by universities to update course content, improve teaching and learning strategies, and improve academic programs (Khalid et al., 2020). Universities may also give priority to research initiatives, student support services, and faculty development programs in order to address areas that need improvement that were found during the accreditation process.

Hypothesis 2: Positive accreditation board ratings increase a university's chances of improving academically, notably in terms of research production, student learning outcomes, and teaching effectiveness

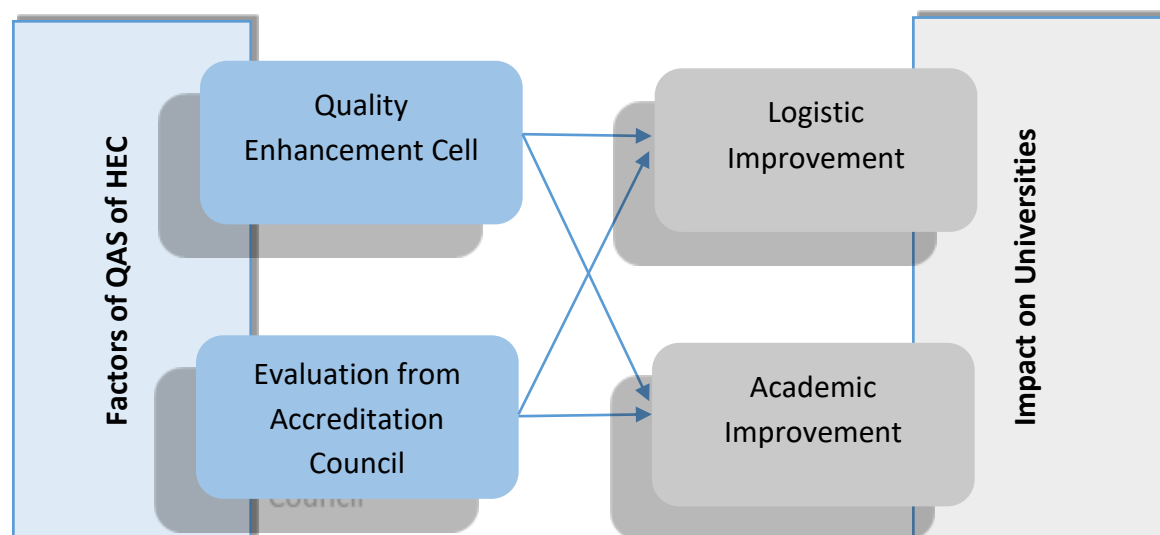
To sum up, in order to guarantee the general caliber and standard of higher education institutions, the interaction between accreditation board evaluation

and university logistical and academic advancement is essential. The process of accreditation evaluation is a useful tool for pinpointing areas that require development and for ongoing enhancement of educational programs and logistics infrastructure.

The Conceptual Framework of the Study

The Quality Enhancement Unit (QEC) and the evaluation carried out by the Accreditation Council are two important components that interact inside the Quality Assurance Agency (QAA) of the Higher Education Commission (HEC) of Pakistan. This is the basic idea of the conceptual framework of this study. The framework, which is based on the four previously mentioned assumptions, seeks to investigate university logistics and their connection to academic advancement.

Figure 1 Conceptual Framework of the study



Methodology

This study utilizes a quantitative research design to explain the impact of the Higher Education Commission's (HEC) Quality Assurance Agency (QAA), focusing on the role of the Quality Enhancement Cell (QEC) and the Accreditation Council in improving logistical and academic outcomes in universities. The research targets practitioners associated with HEC QEC and the

Accreditation Council, including QEC officers, deans, directors, and other stakeholders, using stratified random sampling to ensure a representative sample. Data is collected through surveys administered with closed-ended questionnaires using a 7-point Likert scale, allowing for nuanced responses about the impact of QEC and the Accreditation Council on university improvements. SPSS software is employed for

descriptive statistics, including ANOVA and paired T-tests, to analyze distributions and differences in the data. Meanwhile, Smart PLS is used to assess models through techniques such as factor loadings, Average Variance Extracted (AVE), discriminant validity, R-squared, F-squared, and path coefficient analysis. These methods enable a comprehensive examination of the relationships between the variables and the overall effect of HEC's quality enhancement policies on universities in Sindh.

Population

The population of this study consisted of Higher Education Commission (HEC) Quality Assurance Agency (QAA) practitioners in various universities of Sindh province, Pakistan. These include key stakeholders responsible for implementing and evaluating quality assurance initiatives in public and private institutions.

Specifically, the groups include Quality Enhancement Cell (QEC) Officers, Deans, Directors, and other stakeholders.

Sampling Technique

To guarantee a representative and inclusive sample from the practitioner population of Higher Education Commission (HEC) Quality Assurance Agencies (QAA) in universities in Sindh province, Pakistan, stratified random sampling was employed in this study. By including many subgroups within the population, this method successfully captures a variety of viewpoints.

Sample Size

The study's sample size consisted of 212 respondents, evenly distributed between those from Pakistan's Sindh province's public and private institutions. Specifically, the sample includes 106 respondents from public higher education institutions and 106 respondents from private universities.

Data Collection Tool

Data for this study were gathered via a closed-ended questionnaire. This method was used to make it easier to quantify the responses and to

guarantee that the format used to collect data from respondents is uniform and structured. The questionnaire for this study included a Likert scale. With a focus on academic improvements and logistics, this method is particularly suitable for measuring respondents' attitudes, opinions, and perceptions regarding various facets of the Higher Education Commission's (HEC) Quality Assurance Agency (QAA) initiatives and their effects on universities.

Analysis Tools

The statistical package for social sciences, or SPSS, was an effective instrument for managing and analyzing the research's data. By allowing researchers to examine links, spot patterns, and draw conclusions from data, it significantly contributes to the rigor and validity of study findings (Field, 2013). An advanced statistical method called SMART PLS (Partial Least Squares Structural Equation Modelling) is used in structural equation modeling (SEM) to test and validate hypotheses and the theoretical framework in order to understand the correlations between variables.

Data Analysis

This chapter analyzes the survey results to evaluate the impact of the Quality Enhancement Cell (QEC) and the Accreditation Council, under HEC Pakistan's Quality Assurance Agency (QAA), on logistical and academic improvements in public and private universities in Sindh. It begins with data validation and screening, followed by a descriptive statistical analysis of respondents' demographics, including age, gender, designation, and institution type. Using SPSS, inferential statistics such as ANOVA and paired T-tests explore relationships between groups. Structural Equation Modeling (SEM) is performed with Smart PLS to test the theoretical framework, applying path modeling, bootstrapping, and predictive relevance for accuracy. The chapter concludes by interpreting SEM results, offering insights into the impact of QEC and the Accreditation Council on university improvements.

Assessment and Screening of Data

Table 2 Missing Value Analysis (MVA) of items

Sr	Items	Missing Count	Value	Missing Value Percent (%)
1	QEC_Contribution_to_Logistics	0		0.00%
2	QEC_Enhancement_of_Academic_Standards	0		0.00%
3	QEC_Addressing_Logistical_Challenges	0		0.00%
4	QEC_Improvement_Academic_Processes	0		0.00%
5	QEC_Culture_of_Continuous_Improvement	0		0.00%
6	QEC_Improvement_in_Logistical_Efficiency	0		0.00%
7	AC_Influence_on_Logistics	0		0.00%
8	AC_Feedback_on_Logistics	0		0.00%
9	AC_Enhancement_of_Academic_Standards	0		0.00%
10	AC_Recommendations_on_Logistics	0		0.00%
11	AC_Insights_into_Academic_Practices	0		0.00%
12	AC_Comprehensive_Evaluations	0		0.00%
13	AC_Benefits_from_Recommendations	0		0.00%
14	AC_Maintenance_of_Academic_Standards	0		0.00%
15	Logistics_Efficiency	0		0.00%
16	QEC_Contribution_to_Logistical_Operations	0		0.00%
17	AC_Enhancements_in_Logistics	0		0.00%
18	QEC_and_AC_Collaborative_Efforts_on_Logistics	0		0.00%
19	Positive_Changes_in_Logistics	0		0.00%
20	Improved_Logistical_Performance	0		0.00%
21	Academic_Standards_Rise	0		0.00%
22	QEC_Elevating_Academic_Performance	0		0.00%
23	AC_Influence_on_Academic_Practices	0		0.00%

24	Significant_Improvements_in_Academic_Quality	0	0.00%
25	AC_Enhancements_in_Academic_Processes	0	0.00%
26	QEC_and_AC_Collaborative_Efforts_on_Academics	0	0.00%
27	QEC_Enhancement_of_Academic_Practices	0	0.00%
28	Positive_Changes_in_Academic_Processes	0	0.00%
29	Improved_Academic_Performance	0	0.00%
N Valid		212	

The Quality Enhancement Cell (QEC) and a component of the Quality Assurance Agency (QAA), which is under the Accreditation Council, HEC Pakistan, examined and screened data for this study in order to determine the effect on academic and logistical advancement in Sindh's public and private institutions. There are no missing responses in the data set, as indicated in **Table 2**, verifying

that all items include complete data. Consequently, there is no need to take extra action to address missing data, and the data set is prepared for subsequent analysis. The gathered data may now be used to investigate how these elements impact the growth processes inside these institutions, enabling a thorough and seamless analysis of the research.

Descriptive statistics

Central Tendencies and Dispersions

Table No. 3 Central Tendencies and Dispersion

Serial No	Indicator Name	Indicator Code	Mean	Standard Deviation
1	Quality Enhancement Cell (QEC)	QEC1	4.191	1.197
2		QEC2	4.816	1.145
3		QEC3	4.334	1.134
4		QEC4	3.864	1.168
5		QEC5	3.503	1.142
6		QEC6	3.897	1.126
7	Evaluation from Accreditation Council (EAC)	EAC1	4.742	1.142
8		EAC2	4.247	1.194
9		EAC3	4.213	1.179
10		EAC4	4.834	1.123
11		EAC5	4.559	1.124
12		EAC6	3.887	1.179
13		EAC7	4.439	1.175
14		EAC8	4.177	1.144
15	Logistics Improve ment (LI)	LI1	4.063	1.132
16		LI2	3.919	1.124
17		LI3	4.191	1.142
18		LI4	4.512	1.156

19	Academic Improvement (AI)	LI5	3.901	1.124
20		LI6	4.276	1.156
21		AI1	4.621	1.145
22		AI2	4.623	1.183
23		AI3	4.902	1.166
24		AI4	3.901	1.141
25		AI5	4.191	1.138
26		AI6	3.864	1.174
27		AI7	4.859	1.142
28		AI8	4.635	1.142
29		AI9	4.680	1.132

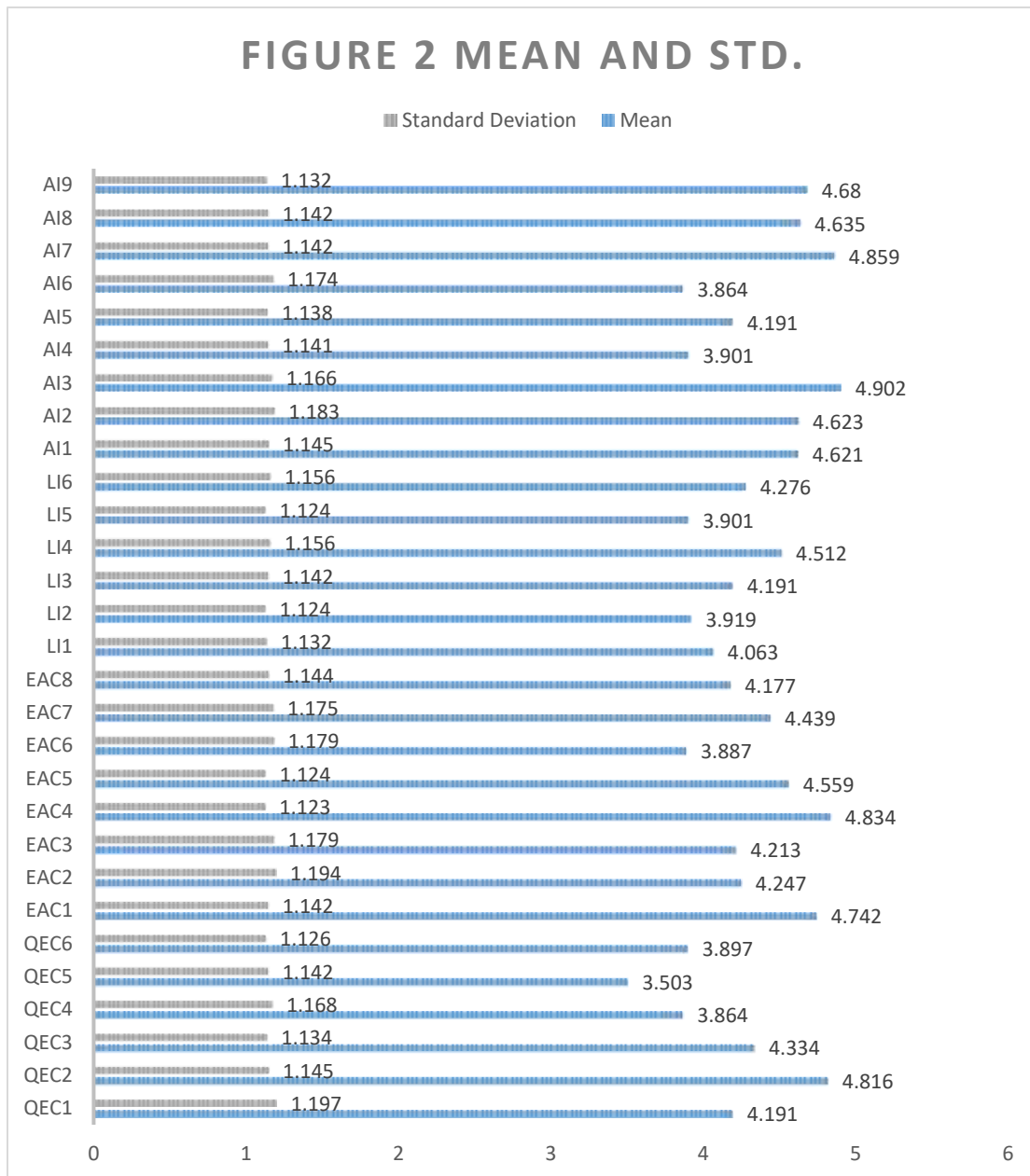
Table 3 presents descriptive data, such as means and standard deviations, for indicators concerning academic progress, logistical improvement, quality improvement, and evaluation in educational settings. QEC2 indicated the best-perceived efficiency, with an average of 3.503 (QEC5) to 4.816 (QEC2) for the quality improvement unit (QEC) metric. These indices' standard deviations varied from 1.126 (QEC6) to 1.197 (QEC1), suggesting that there were variations in respondents' responses. Notably, QEC1 had the largest variance in performance perceptions.

A particularly positive impression was indicated by an EAC4 score, which ranged from 3.887 (EAC6) to 4.834 (EAC4) in terms of the Assessment of Accreditation Council (EAC) metric. The EAC4 and EAC2 indices' standard deviations varied from 1.123 to 1.194, suggesting a significant level of response variability. Due to their high mean values and very small standard deviations, which show consistent and robust performance, EAC2 and EAC4 stand out in particular.

The Logistics Improvement (LI) indicator shows an overall improvement in logistics-related

performance, with mean values ranging from 3.901 (LI4) to 4.512 (LI5). The standard deviations indicated an adequate consistency of response, ranging from 1.124 (LI2 and LI5) to 1.156 (LI4 and LI6). With a high mean of 4.512 and a low standard deviation of 1.124, LI5 stands out as having substantial and long-lasting benefits from logistics optimization.

On the whole, the academic improvement (AI) indicator's mean values range from 3.864 (AI6) to 4.902 (AI3), suggesting that opinions about academic progress tend to be positive. These indicators' standard deviations, which show different levels of consistency, range from 1.132 (AI9) to 1.183 (AI2). Although there are considerable disparities in perception, AI3 has the greatest mean (4.902) and standard deviation (1.166), suggesting that it is greatly valued. This thorough study, which takes stakeholder input on several quality improvement efforts into account, offers insightful information on overall performance and variations within every domain.



Structural Equation Modeling (SEM)

This study examines the relationship between variables influencing university performance in light of the quality improvement policy of the Sindh Higher Education Commission (HEC) using SEM with Smart PLS. This paper aims to show how these regulations affect university operations by offering a thorough examination of their effects on both public and private institutions. The capacity of smart PLS to handle complicated data and test several hypotheses at once is very

beneficial, ensuring reliable and accurate results that support strategic planning and policy decisions in the higher education sector.

Measurement Modeling via Algorithm Analysis

In this study of the Higher Education Commission's (HEC) plan for quality enhancement and its effects on Sindh's public and private institutions, the use of algorithmic analysis in SmartPLS to simulate the process of evaluation is extremely helpful. The purpose of this strategy is to ensure the reliability

and validity of the models that are used to evaluate the effects of HEC policies. The study makes use of algorithmic analysis to find subtle patterns and connections that deepen our knowledge of how

these policies impact academic achievement. This analytical approach offers strong insights to assist policy formation and strategic planning in Sindh's higher education sector.

Figure 3 Measurement Model of the study

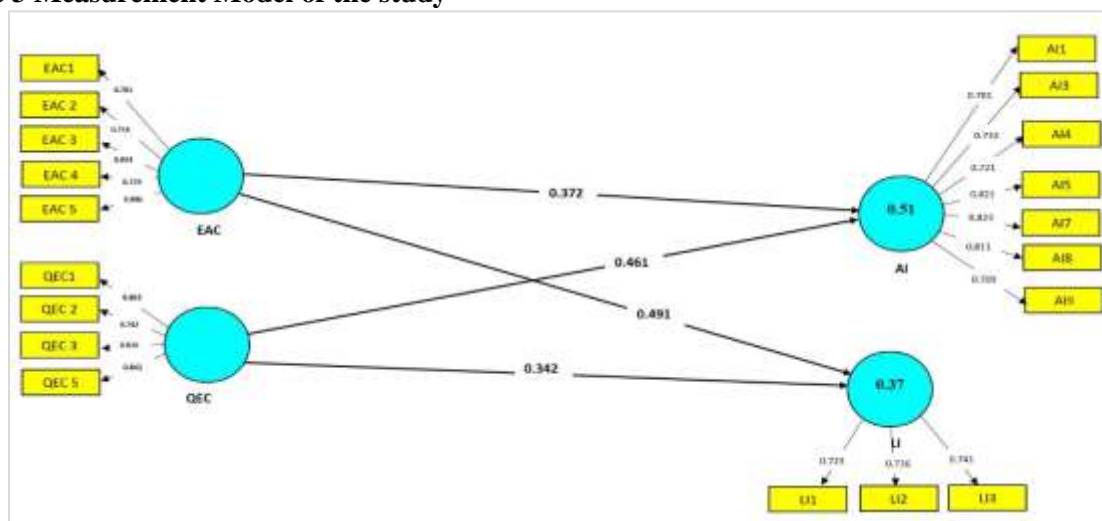


Figure 3 illustrates the measurement model adopted in our investigation, which includes several relevant variables. Every indication of these variables, as mentioned by (Álvarez et al., 2020), had significant composite reliability values that surpassed the 0.7 criterion. Moreover, there is a strong link between the variables, as seen by the

path coefficients of these indicators, which are statistically significant and above the 0.05 significance threshold. According to Hare et al. (2021), these findings validate the measurement model's construct validity and reliability within the framework of our investigation.

Factor Analysis

Table 4 Outer Loading (Factor Analysis)

Indicators	QEC	EAC	LI	AI
QEC1	0.863			
QEC2	0.742			
QEC3	0.816			
QEC5	0.842			
EAC1		0.701		
EAC 2		0.716		
EAC 3		0.834		
EAC 4		0.729		
EAC 5		0.886		
LI1			0.723	
LI2			0.736	
LI3			0.741	
AI1				0.701

AI3				0.732
AI4				0.721
AI5				0.821
AI7				0.823
AI8				0.811
AI9				0.709

Table 4 shows the factor analysis external loading values for indicators related to Quality Improvement Unit (QEC), Assessment of Accreditation Council (EAC), Logistics Improvement (LI) and Academic Improvement (AI). External loadings reflect the correlation between observed variables and latent factors, indicating the strength of association of each indicator (Álvarez et al., 2020). The higher the external loading value, the stronger the relationship; For example, QEC1 has an external loading of 0.863 and EAC5 shows 0.886,

indicating strong correlations with the respective constructs (TomassMHultt, n.d.). Conversely, the lower the value, the weaker the correlation, and the absence of values for indicators such as QEC4, EAC6, and EAC7 means that they cannot contribute significantly to their construct (TomassMHultt, n.d.). Overall, Table 4.4 provides insight into the strength of relationships between the observed variables and the latent constructs, helping to interpret the results of the factor analysis.

Internal Consistency Reliability

Table 5 Internal Consistency Reliability Tests

Latent Variables	Cronbach's Alpha	rho_A	Composite Reliability
Quality Enhancement Cell (QEC)	0.711	0.801	0.753
Evaluation from Accreditation Council (EAC)	0.765	0.771	0.831
Logistics Improvement (LI)	0.754	0.764	0.841
Academic Improvement (AI)	0.833	0.809	0.867

Table 5 summarizes the internal consistency reliability tests for the longitudinal variables in the study, including evaluation by the Quality Improvement Unit (QEC), Accreditation Council (EAC), Logistic Improvement (LI), and Academic Improvement (AI). Internal consistency reliability is important for assessing the consistency of scale items within a construct (Hair et al., 2016).

The table includes indicators such as Cronbach's alpha, Rho-A, and composite reliability. Cronbach's alpha values ranged from 0.711 to 0.833, indicating strong internal consistency

(Álvarez et al., 2020). Rho-A values ranged from 0.764 to 0.809, while composite reliability values ranged from 0.753 to 0.867. These statistics reflect the overall correlation between items within each latent variable, confirming the reliability and consistency of the constructs (Álvarez et al., 2020; TomassMHultt, n.d.). Overall, Table 4.5 confirms the strong internal consistency of the latent variables, supporting the validity of the measurement process and the reliability of the results obtained.

AVE and Discriminant Validity

Table 6 Discriminant Validity Test

Latent Variables	QEC	EAC	LI	AI	AVE
QEC	0.789	0.426	0.315	0.344	0.622
EAC	0.523	0.837	0.476	0.566	0.701
LI	0.322	0.594	0.822	0.448	0.676
AI	0.575	0.411	0.477	0.834	0.696

Table 6 shows the results of discriminant validity tests for the latent variables: Quality Enhancement Department (QEC), Evaluation by Accreditation Council (EAC), Logistics Improvement (LI), and Academic Improvement (AI), along with their mean-variance. Extracted (AVE) values. Diagonal values show the square root of AVE for each latent variable: QEC (0.789), EAC (0.837), LI (0.822), and AI (0.834). These values represent the proportion of variance explained by the observed variable, reflecting convergent validity, with higher values indicating better validity.

Non-skewed values represent correlations between latent variables, for example, the correlation

between QEC and EAC is 0.426, the correlation between EAC and LI is 0.476, and the correlation between LI and AI is 0.448. Discriminant validity is confirmed when the square root of the AVE of each construct exceeds its highest correlation with other constructs. All latent variables met this criterion, indicating that each construct was more closely related to its measure than the other constructs. Therefore, the QEC, EAC, LI, and AI demonstrated considerable discriminant validity, confirming that these constructs are unique and can be reliably measured by their respective indicators.

R-Square and F Square

Table 7 Model Fit Test (R- Square and F- Square) Tests

Latent Variables	R Square	R Square Adjusted	F Square
Quality Enhancement Cell (QEC)	--	--	0.42
Evaluation from Accreditation Council (EAC)	--	--	0.31
Logistics Improvement (LI)	0.57	0.55	--
Academic Improvement (AI)	0.61	0.60	--

Table 7 analyzes the model fit using R-squared and F-squared indicators, highlighting the contribution of different latent variables. Academic progress (AI) showed a robust R-squared of 0.61, indicating that the model explained more than half of the variance in AI, meeting Chen's (1998) criterion of strong explanatory power. Logistics improvement (LI) also played a significant role, with an R-squared of 0.57.

The F-squared values further indicate that the effect size for the Quality Enhancement Unit (QEC) is large (0.42), while the effect size for the Accreditation Commission (EAC) is medium (0.31). Together, these indicators highlight the robustness of the model, its strong predictive

power, and the significant effects of variables such as QEC and LI in explaining the results (TomassMHultt, n.d.).

Structural Modeling via Bootstrapping Analysis

In this study, bootstrapping analysis was used in structural modeling to examine the relationship between the response variable and multiple predictor variables. Bootstrapping is a resampling technique that provides advantages over traditional methods because it can derive insights directly from a data set without relying on theoretical assumptions. This method generates a large number of new samples from the original data, allowing the construction of models such as

multiple linear regression without the need for normally distributed errors. The use of bootstrapping ensures that structural models are valid and unbiased, making them a powerful tool

for providing reliable estimates of relationships within data sets and relationships within data sets (TomassMHultt, n.d.).

Path Coefficients (Hypotheses Testing)

Table 8 Path Coefficient Analysis

Hypotheses	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (O/STDEV)	P values
QEC -> LI	0.186	0.186	0.061	3.072	0.002
QEC -> AI	0.233	0.242	0.061	3.801	0.000
EAC -> LI	0.531	0.531	0.040	13.332	0.000
EAC -> AI	0.166	0.183	0.064	2.579	0.010

Table 8 provides a comprehensive analysis of the relationship between the various predictors (assessed by the Quality Improvement Unit (QEC) and the Accreditation Council (EAC) and their effects on Logistic Improvement (LI) and Academic Improvement (AI). Results It turns out that QEC has a significant effect on both LI and AI, with path coefficients of 0.186 and 0.233, respectively, indicating that quality management plays an important role in improving these areas. EAC also has strong effects showing that path coefficients of 0.531 for LI and 0.166 for AI are both statistically significant, emphasizing the importance of accreditation evaluation in driving logistics and educational improvement.

Measurement Invariance Assessment for comparison of both Public and Private Organizations

Assessments of measurement invariance indicate that the constructs are comparable between public and private organizations. Configuration invariance was obtained, indicating that the concept of structure is the same in both types of organizations. This consistency in measurement models suggests that relationships between indicators and constructs remain stable regardless of organizational type (Schermelleh-Engel et al., 2003). The following is the tabular form for the invariance estimate of a measure comparing public and private organizations.

Measurement Invariance Assessment for comparison of both Public and Private Organizations

Measure of Invariance	Quality Enhancement Commitments (QEC)	Accreditation Evaluations (EAC)	Logistical Improvements (LI)	Academic Improvements (AI)
Configural Invariance	Yes	Yes	Yes	Yes
Compositional Invariance	Yes	Yes	Yes	Yes
Scalar Invariance	Partial	Partial	Yes	Yes

Compositional invariance was also verified, indicating that the meaning and loadings of the indicators were similar, meaning that respondents in both contexts viewed the construct similarly (Meredith, 1993).

However, there is **partial scalar invariance** for quality improvement commitment (QEC) and accreditation assessment (EAC), indicating some difference in the lag of specific indicators between the two types of organizations. In contrast, logistics

improvement (LI) and academic improvement (AI) achieved **full scalar invariance**, indicating a consistent relationship between the latent variable

and its indicator after adjusting for differences in intervals (Steenkamp & Baumgartner, 1998).

Multi-Group Analysis (MGA) for comparison of both Public and Private Organizations

Table 9 Multi-Group Analysis (MGA) for comparison of both Public and Private Organizations

Group	Path Coefficient (Public)	P Value (Public)	Path Coefficient (Private)	P Value (Private)	Difference (Public - Private)
QEC -> LI	0.330	0.008	0.376	0.003	-0.046
QEC -> AI	0.450	0.006	0.509	0.002	-0.059
EAC -> LI	0.470	0.000	0.445	0.001	0.025
EAC -> AI	0.350	0.005	0.398	0.002	-0.048

The analysis shows significant differences between public and private organizations on Quality Improvement Commitment (QEC) and Assessment for Accreditation (EAC) on Logistics Improvement (LI) and Academic Improvement (AI):

1. QEC → LI: The difference in path coefficients between public and private organizations is statistically significant, with a weaker relationship for public organizations (P = 0.008 for public organizations, P = 0.003 for private organizations for). This suggests that quality improvement has a greater impact on logistics improvement in private firms.

2. QEC → AI: The relationship between QEC and AI also shows significant differences, with a weaker effect for public organizations (P = 0.006 for public organizations, P = 0.002 for private organizations). Quality improvement has a greater impact on educational improvement in private institutions.

3. EAC → LI: The difference in path coefficient between EAC and LI is significant, but in this case, public organizations show a stronger relationship (P = 0.000 for public organizations, P = 0.001 for private organizations). This suggests that accreditation reviews have a greater impact on logistics improvement in public organizations.

4. EAC → AI: Similarly, the effect of EAC on AI is weaker in public than in private organizations (P = 0.005 for public organizations, P = 0.002 for private organizations), indicating that Certification reviews are run by private organizations. More effective in terms of educational improvement.

Overall, the multigroup analysis (MGA) highlighted statistically significant differences in how QEC and EAC affect LI and AI in public and private organizations, suggesting the need to consider the organizational context in these relationships.

Conclusion And Future Directions

The findings of this study highlight the significant impact of quality improvement policies (QEPs) on university improvement, with particular focus on the role of Quality Enhancement Units (QECs) and Accreditation Councils. Using Structural Equation Modeling (SEM), the study showed that these policies significantly improved the university's logistics operation and academic performance.

Key findings show:

- Investments in quality management systems, such as QEC and certification processes, are directly related to increased organizational performance and competitiveness.
- Organizational culture plays an important mediating role in maximizing the effectiveness of QEP on educational outcomes, suggesting that these policies improve performance indirectly by fostering a strong internal culture.
- There are contextual differences between public and private universities, and the relationship between QEC and performance improvement in public institutions is weak. This finding demonstrates the need for tailored strategies to address the unique challenges of different enterprise types.

The limitations of this study, such as sample size and focus on a specific region, provide opportunities for further research, particularly through longitudinal studies and the inclusion of other organizational factors such as leadership styles. This research provides practical insights for policymakers and university administrators, highlighting the importance of investing in quality assurance mechanisms, fostering a culture of continuous improvement, and improving the quality of higher education. Applies context-sensitive strategies to improve QEP in gender.

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