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# The Relationship between Total Quality Management and Education Performance with Mediating Effects of Quality Assurance and Accreditation System in Pakistan Higher Education

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**ABSTRACT**

Total quality management has received significant attention in the last few decades, with its applicability expanding across various industries, including higher education, to improve quality processes. Drawing on contingency and social theory, this research examines the mediating role of the quality assurance and accreditation system in the relationship between total quality management and the educational performance of higher education institutions in Pakistan. To attain the objectives, a close-ended, structured questionnaire was distributed via self-administration and emailed to 600 top management members of higher education institutions, selected through convenience sampling from the total population of 1291. To analyse the data and test the hypothesis, the partial least squares structural equation modeling technique was employed using the bootstrap method. The empirical result revealed that TQM is positively associated with the educational performance of higher education institutions in Pakistan. Furthermore, the quality assurance and accreditation system is positively correlated with the educational performance of higher education institutions in Pakistan. Moreover, quality assurance and accreditation both mediate the relationship between TQM and educational performance. Lastly, quality assurance was also found to be positively related to the accreditation system in higher education institutions in Pakistan. The study contributes to the existing literature by developing a pathway grounded in accreditation and quality assurance to improve educational performance.

**Keywords:** Total Quality Management, Education Performance, Quality Assurance, Accreditation, Higher Education
**JEL Classifications:** I23, I21, L15

## 1. INTRODUCTION

Pakistan's higher education industry has witnessed exceptional growth in the past decades. However, it faced numerous issues and challenges, including ineffective planning, poor structure, limited financial resources for research and development (Hussain et al., 2026), and insufficient human resources (Hussain et al., 2026). In addition, Pakistan has a significant gender disparity in higher education, with male enrollment being much higher than female enrollment. In 2018, the gross enrollment rate for males was 12.6%, while for females, it was only 6.3% (Zubairi et al., 2021). In addition, only 6 of 188 universities in the country are ranked among the top 1,000 worldwide by QS (Akram et al., 2022). This reflects the poor quality of education being provided in the country.

Furthermore, this alarming situation is also supported by the Global Competitiveness Report, which ranks Pakistan's higher education institutions (including universities) 120$^{th}$ out of 141, well below their counterparts (Akram et al., 2022). Furthermore, the QS ranking system has only included six institutions from Pakistan on its list of the top 800 universities in the world (Akram and Ahmad, 2021). This poor position of Pakistani higher education institutions reveals a worrying nexus between poor quality and performance, making this research relevant. Consequently, 75% of students who graduate from public universities possess only fundamental skills

for performing tasks (Akram et al., 2022; Hinduja et al., 2023). However, universities need to improve their efforts to address these alarming shortcomings (Abbas et al., 2022), indicating the poor quality standards adopted and implemented by HEIs in Pakistan.

The high success and failure rate in adopting TQM has been the subject of several studies, which have presented their findings (Alhosani and Yaakub, 2025; Fraihat and Alaa, 2023). Findings from specific research have demonstrated that the use of TQM in institutions did not yield results, while findings from other studies on the effectiveness of TQM methods are mixed (Alhosani and Yaakub, 2025; Sumi and Kabir, 2022). Similarly, TQM and organizational performance have been critical concepts in business and academic settings. As a result, they have been the subject of extensive research worldwide, including in Pakistan (Fernandes and Singh, 2022; Osman, 2024). However, mixed results have been found, such as the fact that some of the researchers report a strong link (Kaur et al., 2019; Shafqat et al., 2021), while others indicate a medium or weak link in the execution of TQM practices and organizational performance (Akgün et al., 2014; Cheah et al., 2023; Escrig-Tena et al., 2018). There are two approaches to quantifying the effect of TQM on an organization's performance: Some academics measure it strictly in terms of financial metrics, such as return on investment and profit (Shafqat et al., 2021). Others, on the other hand, have assessed it in non-financial terms, such as customer happiness, process improvements, and employee satisfaction (Aichouni and Ferreira, 2024). Consequently, the previous body of research yields contrasting findings regarding the relationship between TQM and organisations. In addition, previous research employed a wide variety of proxies to evaluate performance (both financial and non-financial measures), another factor contributing to the conflicting findings and calling for a more rigorous investigation (Ibrahim and Alaezi, 2023).

In addition, it has been stated that the strength of this link depends on several other factors, including socio-economic, cultural, and quality factors prevalent within and around the company (Alhosani and Yaakub, 2025). Providing quality education is the primary goal of higher education institutions (Akour and Alenezi, 2022). Therefore, several academics have shed light on the nexus between total quality management and quality assurance (Aldoseri and Sharadgah, 2021) and the crucial role of the accreditation system (Ab-Rahman and Kaharudin, 2025), which may lead to improved education performance (Akram et al., 2022). Quality assurance and meeting education standards through accreditation systems primarily reflect the knowledge and courtesy of organisational employees, which facilitate the service organisation in building customer trust and confidence (Angwaomaodoko, 2025; Shafqat et al., 2021).

Therefore, this research posits that the quality assurance and accreditation system acts as an intermediary mechanism through which TQM practices may transmit their impact on educational performance (Osman, 2024; Talib, 2023). TQM practices offer a managerial philosophy that strives to maximise continuous improvement, stakeholder focus, and process optimisation; however, their influence on institutional performance is frequently conditioned by the organisation's formal governance and assessment systems (Talib, 2023). TQM principles applied in higher education are operationalised through systematic monitoring, performance assessment, curriculum review, and continuous improvement processes, necessary to maintain quality management practices across academic and administrative processes (Harvey and Williams, 2023; Stensaker and Matear, 2025). Moreover, accreditation systems provide external validation and regulatory oversight, which enable universities to structure their policies, teaching standards, and research practices in line with accepted quality standards and national regulatory requirements (Angwaomaodoko, 2025). These processes are thus institutional conduits that create measurable changes in teaching, research, and institutional service performance through internal quality management initiatives (Elassy, 2022; Martin and Stella, 2007). Therefore, the combination of TQM practices and quality assurance and accreditation frameworks enables universities to institutionalise a culture of quality and responsibility, thereby improving overall educational performance and the effectiveness of the institution.

Nevertheless, prior literature provides less empirical evidence on the evaluation of quality assurance and accreditation systems in higher education (Angwaomaodoko, 2025; Cheah et al., 2023; Iqbal et al., 2023), especially in the relationship between TQM and quality education in Pakistan (Akram et al., 2022; Iqbal et al., 2023). The studies that incorporate and examine them as mediators between TQM and educational performance create a theoretical gap in the literature. Moreover, prior literature indicates that TQM is in its infancy in higher education institutions in Pakistan, despite its global application in this sector (Iqbal et al., 2022). Therefore, empirical studies are scarce and require extensive research. To fill this theoretical gap, this study aims to examine the relationship between TQM practices and educational performance. Furthermore, it examines the mediating role of quality assurance and accreditation systems in the relationship between total quality management practices and the performance of higher education institutions in Pakistan.

## 2. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The theoretical framework is grounded in Contingency Theory and Social System Theory as a combination of the two theories presents a comprehensive explanation of the implications of total quality management (TQM) practices on the educational performance of higher education institutions. The Contingency Theory holds that management is not a universal best practice applicable to all organisations; rather, the success with which organisations perform depends on the match between management practices and the environments in which they operate (Donaldson, 2006). Applied to higher education, the theory explains why TQM practices may not always result in improved educational performance unless they are coupled with institutional processes such as quality assurance and accreditation systems. Universities are dynamic and complex environments that are affected by regulatory requirements, stakeholder expectations, technological change, and competition (Azizah, 2025). Consequently, TQM practices are exploited when

universities change and refocus them to fit institutional needs and integrate them into official quality frameworks (Cabacang, 2021). In this connection, quality assurance and accreditation systems could be regarded as contingent processes used to translate TQM principles into measurable educational outcomes (Cabacang, 2021; Elken and Stensaker, 2018). Contingency Theory can therefore provide a useful insight into how effective institutional structures and environmental fit can make the difference in the success of TQM.

At the same time, the Social System Theory views organisations as connected systems in which different components work together as a unit towards a common end (Gong et al., 2023). Universities are social systems that consist of academic departments, administrative structures, faculty members, students and external stakeholders; their activities are interdependent (Abnoulgid et al., 2025; Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). This theory helps to understand that educational performance cannot be the product of a single managerial action but rather arises from institutional interaction and shared values. The TQM principles promote teamwork, continuous improvement, and stakeholder engagement, and quality assurance/accreditation systems ensure that these relationships are standardized, monitored, and aligned with the institutional goals (Alhosani and Yaakub, 2025). In this regard, accreditation and quality assurance are coordinating subsystems which enhance organisational integration and shared responsibility. Social System Theory is thus an extension of the Contingency Theory, in that it elucidates how institutions coordinate internally and how the system coordinates to qualify educational performance. Each of these theories has a strong conceptual basis for exploring the direct and mediating relationships this study aims to establish.

## 2.1. TQM Practices and Educational Performance

The term "total quality management" (TQM) refers to a concept that aims to "attain corporate excellence via the use of methodologies and technology" (Alhosani and Yaakub, 2025; Ghaith and Ghaith, 2023). By emphasizing measurement, continuous improvement, and control, it seeks to satisfy the client's specified needs (Ibrahim and Alaezi, 2023). Based on an analysis of the relevant literature, this study has identified success characteristics of TQM, and these findings have been replicated several times (Quazi and Bartels, 1998). Following a comprehensive analysis of the relevant published literature, 76 studies conducted across various countries have identified 18 universally relevant success criteria for the adoption of TQM (Ghaith and Ghaith, 2023; Knol, 2022; Lim et al., 2022; Nguyen and Pham, 2023). A large body of research has shown a substantial relationship between TQM practices and business performance (Fraihat and Alaa, 2023; Kumar et al., 2009). However, only a small number of studies have demonstrated that TQM did not increase performance (Ahmad et al., 2015; Osman, 2024). Therefore, the following is the hypothesis written below:

$H_1$: TQM practices are positively related to educational performance.

## 2.2. Quality Assurance as a Mediator

"Quality assurance" refers to the plans and activities taken methodically to provide confidence that quality requirements will be met. These requirements reflect customers' requirements and must be met, maintained, and enhanced to provide excellent service (Al-Zoubi and Al Kaabi, 2023). The International Organization for Standardization (ISO) defines quality assurance as management through systematic planning and activities to meet quality requirements. This definition describes quality assurance as an integral component of management (Elken and Stensaker, 2023). The Education Quality Assurance System is described as a systemic and integrated activity by academic units or programs, organizers of academic units or programs, local governments, the Government, and the community to increase the level of intelligence of the nation's life through education (Aldoseri and Sharadgah, 2021).

Over the past few years, universities have been open to the principles of total quality management (TQM) to improve the quality of instruction, the effectiveness of administration, and the improvement process (Elassy, 2022). Nevertheless, researchers also claim that the use of TQM in universities tends to be effective when internal quality assurance systems are properly developed to track, assess, and continuously enhance institutional processes (Erittu and Turri, 2023). The quality assurance models generally comprise the systematic assessment of teaching and learning, curriculum design, teaching faculty performance assessment, and self-assessment systems, which are part of the operationalization of the quality management principles (Hafeez et al., 2023). According to recent empirical research, it is argued that QA systems serve as a significant mediating factor that helps institutions implement TQM practices on the ground and translate them into better educational outcomes (Nguyen and Pham, 2023). For example, studies show that organized quality assurance activities can provide ongoing feedback, support evidence-based decision-making, and facilitate institutional learning, which in turn supports the links between management practices and educational performance (Greere, 2023).

In establishing higher education systems like Pakistan's, the role of QA has become increasingly critical amid mounting pressure on universities to comply with national and international standards of academic excellence (Hauptman Komotar, 2018). Quality enhancement cells (QECs) constitute another institutionalization of QA processes to enhance the quality of academic processes and institutional performance (Hussain et al., 2026). Despite these changes, empirical studies examining the mediating role of quality assurance in the relationship between TQM and educational performance have not been conducted, especially within the Pakistani higher education system (Hinduja et al., 2023; Hussain et al., 2026). The majority of research has examined the direct relationship between TQM practices and institutional performance, without considering how these practices drive performance gains (Elassy, 2022). Thus, analyzing quality assurance as a mediating construct provides a more detailed insight into the translation of TQM initiatives into higher education institutions through improvements in educational performance. Hence, following is the hypothesis:

$H_2$: Quality Assurance mediates the relationship between TQM practices and educational performance.

## 2.3. Accreditation System as a Mediator

Accreditation systems have slowly become one of the institutional instruments for implementing total quality management (TQM) principles to achieve measurable educational outcomes in higher education institutions (HEIs). Even though TQM is based on continuous improvement, stakeholder orientation, leadership commitment and process optimization (Alfaridli and et al., 2024), the success of TQM in learning institutions is usually supported by formal governance and evaluation systems that institutionalize TQM practices. This is where accreditation comes in, as it translates the overall philosophy of quality into standardized processes, performance standards, and accountability frameworks (Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). The prior literature on TQM has largely focused on the direct correlation between the practice of quality management and institutional performance, presuming that managers' dedication and process improvements are logical outcomes of improved educational performance (Alhosani and Yaakub, 2025). However, the assumptions have been criticized for overlooking the institutional processes necessary to support and legitimize quality initiatives in universities.

Current studies have shifted towards embracing accreditation as more than a compliance exercise. Accreditation is becoming a strategic tool of quality assurance that increases the institution's legitimacy, supports evidence-based decision-making, and facilitates systematic monitoring of performance (Akhmatova et al., 2022). Studies have revealed that accredited institutions tend to possess superior academic planning and curriculum alignment, enhanced governance structures, and greater confidence among stakeholders than non-accredited institutions (Fraihat and Alaa, 2023). Similarly, research on accreditation and quality assurance systems highlights that accreditation practice improves an institution's learning and reputation by putting in place a system of ongoing assessment and enhancement in universities (Ibrahim and Alaezi, 2023). Despite these developments, the literature remains theoretically disjointed and empirically inconclusive regarding the mediating role of accreditation in the relationship between TQM and educational performance (Ibrahim and Alaezi, 2023; Kaur et al., 2019).

The majority of the research focuses on the TQM-performance relations or accreditation-performance relations on their own, and they do not explain the way in which accreditation operationalizes (Angwaomaodoko, 2025; Buetow and Wellingham, 2003). Accreditation has been linked to better-quality cultures and improved institutional performance, yet most studies focus on direct outcomes rather than mediating processes (Aldoseri and Sharadgah, 2021). Moreover, research on accreditation is often based on descriptive or policy-based studies, which provide inadequate empirical testing of mediation models, especially in the context of higher education in developing countries (Azizah, 2025; Duarte and Vardasca, 2023).

New evidence, however, indicates that accreditation can be the institutional bridge that is lacking between TQM initiatives and educational performance (Buetow and Wellingham, 2003). A recent empirical study in the higher education sector indicated that academic accreditation plays a significant mediating role between quality management initiatives and the institutional performance of higher education institutions, meaning that TQM practices produce greater effects when integrated into formal accreditation systems (Radiana and Militansina, 2024). Baes on the above discussion, below is the relevant hypothesis:

$H_3$: The accreditation system mediates the relationship between TQM practices and education performance.

## 2.4. Accreditation System and the Quality Assurance

In the 21st century, marked by increased competitiveness in human resources, personality development, accompanied by the acquisition of qualified skills, is the basis for the demands placed on skills in this century (Alfaridli and et al., 2024). According to Acevedo-De-los-Ríos and Rondinel-Oviedo (2022), every individual must have mastered digital skills by the turn of the 21st century. A better generation is required to increase its level of competence for it to continue existing in the context of the development of life in the 21st century. Providing education with an exceptionally high standard is one of the most critical factors in producing an exceptional generation (Azizah, 2025). The caliber of graduates produced (the output) is one of the best measures of the educational system's effectiveness; can these graduates compete successfully at the state, national, and even international levels? This is based on the assumption that education is the most critical factor in developing human resources, thereby fostering a more capable generation that will further advance world civilization (Greere, 2023).

In this light, it is necessary to implement quality control in education (Elassy, 2022; Greere, 2023), and this need also applies to the modern curriculum.

Furthermore, the connection between quality assurance and accreditation systems in higher education is not new in the literature, as accreditation is typically viewed as a formal process of external quality assurance that helps determine whether institutions comply with established standards of academic and organisational excellence (Hazelkorn, 2022). In a higher education system, quality assurance is generally an internal and external process comprising self-evaluation and continuous improvement systems, as well as accreditation processes, which, together, uphold acceptable academic standards and accountability within institutions (Prabowo et al., 2024). Accreditation is thus considered a framework of structured evaluation in which quality assurance processes are confirmed and authenticated by external regulatory or professional bodies, thereby providing transparency, credibility, and adherence to national or international standards (Kiersma et al., 2025). According to recent research, accreditation also enhances institutional quality assurance by encouraging systematic self-assessment, peer review, and evidence-based review of teaching, research, and administrative processes, thereby strengthening the culture of continuous improvement in universities (Miranda et al., 2021). Thereby, the following hypothesis is derived:

$H_4$: The accreditation system is positively related to quality assurance.

Based on the above discussion, the following is the conceptual framework of the study depicted as Figure 1:

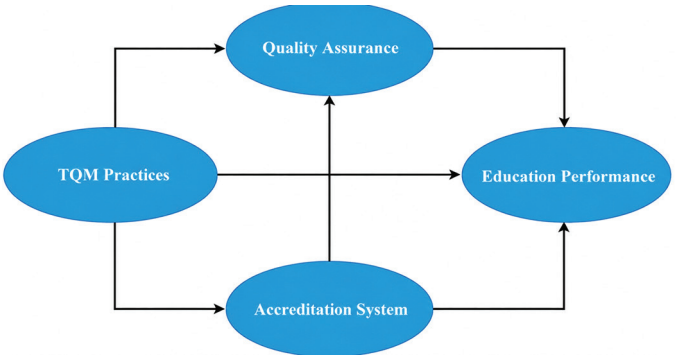
## 3. METHODOLOGY

The research approach in this study was a positivist research philosophy and a quantitative research design to determine the nexus between total quality management (TQM) practices, quality assurance, accreditation systems, and the educational performance of higher education institutions in Pakistan. Hypotheses based on Contingency Theory and Social System Theory were tested with the help of a deductive approach. The study aimed to investigate relationships among measurable variables and test theoretically based assumptions; therefore, a cross-sectional survey was deemed the best study design. The study population comprised 226 universities in Pakistan: 117 public and 111 private. The unit of analysis was the higher education institution, with respondents comprising senior academic and administrative staff, including Vice Chancellors, Deans, Directors, Directors of Quality Enhancement Cells (QECs), Registrars, and Controllers of Examinations. These respondents were chosen as they are directly involved in the quality management of institutions, accreditation, and performance assessment, in line with the similar studies (Akram and Ahmad, 2021; Shafqat et al., 2021).

Stratified random sampling was used to ensure that various institutional categories were well represented, accounting for factors such as sector and provincial distribution. The 600 questionnaires were administered online and in person to collect the data. The required number of questionnaires (308) was received and used to conduct the final analysis. The data were gathered using a structured questionnaire based on established, validated measures from the TQM and higher education literature. The instrument was divided into two parts. The first gathered demographic and institutional information, while the second measured TQM practices, quality assurance, accreditation systems, and educational performance. The questionnaire was piloted before use in the large-scale data collection to ensure it was clear and relevant. The collected data were analyzed using SPSS and SmartPLS. Descriptive statistics and preliminary data screening were performed in SPSS, whereas the partial least squares structural equation modeling (PLS-SEM) was done in SmartPLS. The analysis used a two-step measurement and assessment process for the structural models (Hair et al., 2019).

All latent constructs were drawn from previous studies to ensure content validity. A second order TQM practices scale was derived from (Bayraktar et al., 2008). Moreover, to measure accreditation system, five items scale was derived from the work of El-Jardali et al. (2008). Quality assurance was measured using a nine-item scale by Alzafari and Ursin (2019). Finally, educational performance was measured using a three-dimensional second-order scale from Dicker et al. (2019). All latent constructs were measured on seven point Likert scale ranging from 1 to 7 where 1 denotes strongly disagree and 7 denotes strongly agree.

**Figure 1:** Conceptual framework




## 4. RESULTS AND FINDINGS

The reliability and validity of all the latent constructs are shown in Table 1. All factor loadings and composite reliability (CR) values are above the recommended 0.70 indicating high internal

**Table 1: Reliability and validity**

| Latent constructs | Items | Item loadings | Construct CR | Construct AVE |
|---|---|---|---|---|
| Total quality management practices | VIS2 | 0.757 | 0.963 | 0.511 |
| | VIS3 | 0.847 | | |
| | VIS4 | 0.844 | | |
| | VIS5 | 0.841 | | |
| | VIS6 | 0.756 | | |
| | EI1 | 0.794 | | |
| | EI2 | 0.829 | | |
| | EI3 | 0.852 | | |
| | EI4 | 0.866 | | |
| | EI5 | 0.835 | | |
| | EI6 | 0.794 | | |
| | EaT1 | 0.814 | | |
| | EaT2 | 0.882 | | |
| | EaT3 | 0.840 | | |
| | EaT4 | 0.836 | | |
| | EaT5 | 0.776 | | |
| | LEAD1 | 0.786 | | |
| | LEAD2 | 0.765 | | |
| | LEAD3 | 0.787 | | |
| | LEAD4 | 0.795 | | |
| | LEAD5 | 0.783 | | |
| | LEAD6 | 0.789 | | |
| | LEAD7 | 0.762 | | |
| | LEAD8 | 0.753 | | |
| | LEAD9 | 0.763 | | |
| | MampA1 | 0.749 | | |
| | MampA2 | 0.756 | | |
| | MampA3 | 0.774 | | |
| | MampA4 | 0.801 | | |
| | MampA5 | 0.786 | | |
| | MampA6 | 0.705 | | |
| | MampA7 | 0.742 | | |
| | OSF1 | 0.817 | | |
| | OSF2 | 0.823 | | |
| | OSF3 | 0.842 | | |
| | OSF4 | 0.821 | | |
| | OSF5 | 0.806 | | |
| | OSF6 | 0.846 | | |
| | PCaI2 | 0.808 | | |
| | PCaI3 | 0.783 | | |
| | PCaI4 | 0.810 | | |
| | PCaI5 | 0.852 | | |
| | PCaI6 | 0.803 | | |
| | PD1 | 0.788 | | |

*(Contd...)*

**Table 1:** ***(Continued)***

| Latent constructs | Items | Item loadings | Construct CR | Construct AVE |
|---|---|---|---|---|
| | PD2 | 0.775 | | |
| | PD3 | 0.793 | | |
| | PD4 | 0.794 | | |
| | PD5 | 0.793 | | |
| | QSI1 | 0.864 | | |
| | QSI2 | 0.863 | | |
| | QSI3 | 0.866 | | |
| | RaREW1 | 0.844 | | |
| | RaREW2 | 0.860 | | |
| | RaREW3 | 0.859 | | |
| | RaREW4 | 0.818 | | |
| | SF1 | 0.851 | | |
| | SF2 | 0.859 | | |
| | SF4 | 0.816 | | |
| Accreditation system | AS1 | 0.761 | 0.841 | 0.608 |
| | AS2 | 0.812 | | |
| | AS3 | 0.810 | | |
| | AS4 | 0.788 | | |
| | AS5 | 0.724 | | |
| Quality assurance | QA1 | 0.779 | 0.923 | 0.617 |
| | QA2 | 0.798 | | |
| | QA3 | 0.810 | | |
| | QA4 | 0.808 | | |
| | QA5 | 0.792 | | |
| | QA6 | 0.767 | | |
| | QA7 | 0.790 | | |
| | QA8 | 0.756 | | |
| | QA9 | 0.768 | | |
| Education performance | SP1 | 0.844 | 0.951 | 0.573 |
| | SP2 | 0.801 | | |
| | SP3 | 0.812 | | |
| | SP4 | 0.806 | | |
| | SP5 | 0.805 | | |
| | SP6 | 0.815 | | |
| | TP1 | 0.820 | | |
| | TP2 | 0.822 | | |
| | TP3 | 0.813 | | |
| | TP4 | 0.836 | | |
| | TP5 | 0.735 | | |
| | RP1 | 0.826 | | |
| | RP2 | 0.826 | | |
| | RP3 | 0.855 | | |
| | RP4 | 0.839 | | |
| | RP5 | 0.700 | | |

consistency (Hair et al., 2017). In the same vein, the average variance extracted (AVE) values are within or above the acceptable threshold of 0.50, ranging from 0.511 (TQM practices) to 0.617 (quality assurance), thus establishing acceptable convergent validity (Akram et al., 2022; Memon et al., 2021).

Moreover, Table 2 reveals the values of variance inflation factor (VIF) to assess the multicollinearity. All values are <5 therefore establishing that there is not multicollinearity issue exists in the hypothesized model (Hair et al., 2019).

Similarly, Table 3 shows the outcome of discriminant validity (HTMT ratio). It shows that all correlational values are <0.90 thus indicating that all latent constructs are distinct at empirical standards (Usakli and Rasoolimanesh, 2023).

**Table 2: Variance inflation factor (VIF)**

| Construct | Education performance | Quality assurance |
|---|---|---|
| Accreditation system | 2.865 | 2.267 |
| Quality assurance | 4.785 | |
| TQM practices | 3.952 | 2.267 |

TQM: Total quality management

After assessing the measurement model, the structural model was evaluated. To compute the significance of the path coefficient, the current study used a bootstrapping process with 5000 bootstrap samples and 308 cases. This procedure was based on the suggestions of recent scholars such as (Hair et al., 2019). Table 4 and Figure 2 depict the results of the hypothesis testing in the current study. It shows that that total quality management (TQM) practices have a significant and positive impact on educational performance, with a beta of 0.347 and a t = 6.42. Therefore, $H_1$ is supported. Similarly, $H_2$ and $H_3$ demonstrate the mediation analysis in this study, as shown in Table 4 and Figure 2.

It reveals that quality assurance significantly mediates the relationship between TQM practices and educational performance, with a beta value of 0.268 and a t = 5.698. IT reveals the partial mediating role of quality assurance between TQM practices and educational performance; therefore, $H_6$ is supported. Similarly, the accreditation system significantly mediates the relationship between practices and educational performance, with a beta of 0.139 and a t = 4.02, supporting $H_3$. It also depicts partial mediation, as the direct relationship between TQM practices and education performance is significant and positive. Finally, H4 reveals the significant and positive impact of accreditation system on quality assurance, with a beta of 0.354 and a t = 6.077, supporting $H_4$.

Hair et al. (2017) stated that the adequate $R^2$ value depends on the perspective in which a given study is conducted. Table 5 shows the estimated R-squared value. It reveals that TQM Practices play a central and transformative role, exhibiting strong positive effects on Accreditation Systems ($R^2 = 0.559$), Quality Assurance (0.791), and Education Performance ($R^2 = 0.857$). These findings emphasize that implementing robust TQM strategies significantly enhances institutional processes and outcomes. Furthermore, the Accreditation System moderately influences Quality Assurance ($R^2 = 0.264$) and has a weaker but positive effect on Education Performance ($R^2 = 0.084$). Quality Assurance serves as a critical intermediary, directly improving Education Performance ($R^2 = 0.296$).

In addition, Chin (1998) delineates the relative influence of a certain external latent variable on endogenous latent variable(s) by examining variations in the R-squared values as a measure of effect magnitude. The effect size is assessed by the increase in the R-squared value of the latent variable linked to the path, which reflects the ratio of the latent variable's unexplained variance (Chin, 1998). Cohen (1988) classifies f-squared ($f^2$) values of 0.02, 0.15, and 0.35 as representing mild, moderate, and strong effects, respectively. The effect sizes for this investigation have been calculated using the previously indicated formula and are displayed in Table 6.

**Figure 2:** Structural model (bootstrapping)

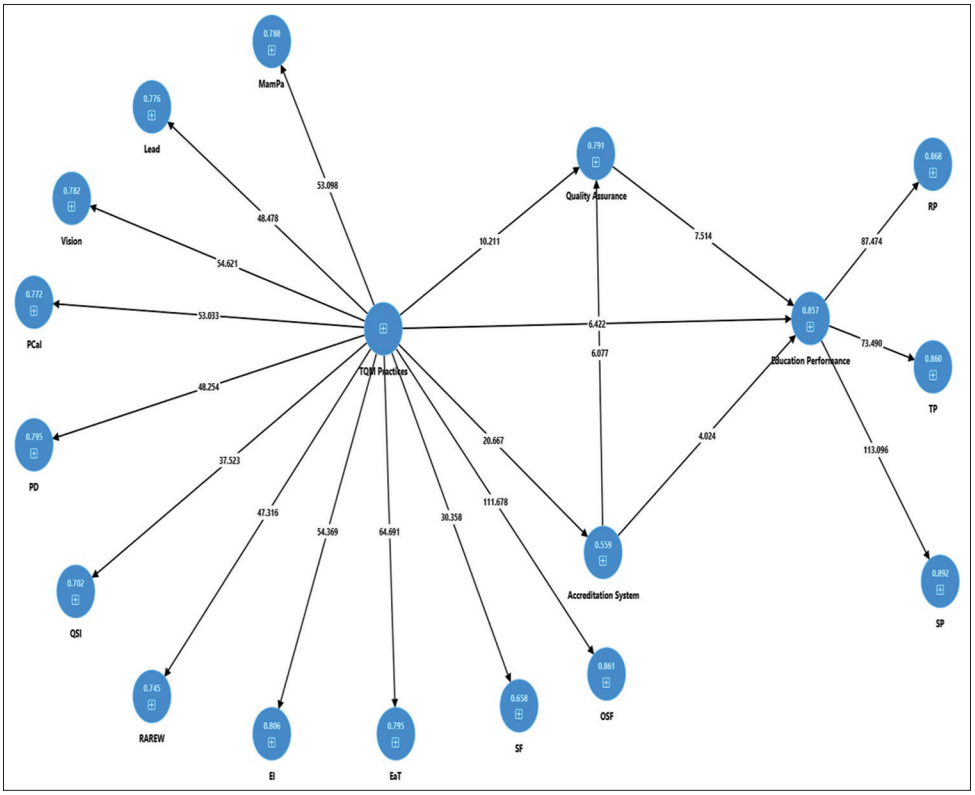



**Table 3: Discriminant validity**

| | Accreditation system | Education performance | Quality assurance | TQM practices |
|---|---|---|---|---|
| Accreditation system | | | | |
| Education performance | 0.700 | | | |
| Quality assurance | 0.605 | 0.757 | | |
| TQM practices | 0.621 | 0.703 | 0.609 | |

TQM: Total quality management

**Table 4: Hypotheses testing**

| Hyp. No | Hypothesized path | β | SD | t-stat | P-value | Decision | Mediation |
|---|---|---|---|---|---|---|---|
| $H_1$ | TQM practices → education performance | 0.347 | 0.054 | 6.422 | 0.000 | Supported | — |
| $H_2$ | TQM practices → quality assurance → education performance | 0.268 | 0.047 | 5.698 | 0.000 | Supported | Partial |
| $H_3$ | TQM practices → accreditation system → education performance | 0.139 | 0.035 | 4.022 | 0.000 | Supported | Partial |
| $H_4$ | Accreditation system → quality assurance | 0.354 | 0.058 | 6.077 | 0.000 | Supported | — |

SD: Standard deviation, TQM: Total quality management

**Table 5: Coefficient determination ($R^2$)**

| Latent constructs | Accreditation system | Education performance | Quality assurance |
|---|---|---|---|
| Accreditation system | | 0.084 | 0.264 |
| Quality assurance | | 0.296 | |
| TQM practices | 0.559 | 0.857 | 0.791 |

TQM: Total quality management

**Table 6: Effect size ($f^2$)**

| | Accreditation system | Education performance | Quality assurance |
|---|---|---|---|
| Accreditation system | | 0.084 | 0.264 |
| Quality assurance | | 0.296 | |
| TQM practices | 1.267 | 0.212 | 0.743 |

TQM: Total quality management

The results reveal that TQM Practices is the most influential construct, with a very large effect on the Accreditation System ($f^2 = 1.267$), a large effect on quality assurance ($f^2 = 0.743$), and a moderate effect on Education Performance ($f^2 = 0.212$). These findings underline the transformative role of TQM Practices in institutional processes. Accreditation Systems exhibit a moderate effect on Quality Assurance ($f^2 = 0.264$) but only a negligible direct impact on Education Performance ($f^2 = 0.084$), suggesting their indirect importance through quality processes. Meanwhile, Quality Assurance moderately influences Education Performance ($f^2 = 0.296$), underscoring its critical mediating role. Predominantly, the cross-validated redundancy measure ($Q^2$) was also applied to assess the predictive relevance of the model, as suggested (Hair et al., 2019), $Q^2$ measures how well a model forecasts the values for omitted cases. Moreover, according to

**Table 7: Predictive relevance ($Q^2$)**

| Endogenous constructs | $Q^2$ predict |
|---|---|
| Accreditation system | 0.551 |
| Education performance | 0.760 |
| Quality assurance | 0.734 |

Memon et al. (2021), a model with a $Q^2$ value >0 is considered to have predictive relevance.

Table 7 demonstrates the model's predictive relevance for the endogenous constructs, confirming its robustness in explaining and predicting key outcomes. The Accreditation System has a $Q^2$ value of 0.551, indicating strong predictive relevance and highlighting the significant role of predictors such as TQM Practices in explaining its variance. Education Performance exhibits the highest predictive relevance ($Q^2 = 0.760$), indicating that the model effectively captures the influence of constructs such as Quality Assurance and TQM Practices on educational outcomes. Quality Assurance also shows a high predictive relevance ($Q^2 = 0.734$), demonstrating that its predictors, including the Accreditation System and TQM Practices, are critical in explaining its variance.

## 5. DISCUSSION

This research, based on Contingency Theory (Fiedler, 1958) and Social System Theory (Luhmann, 1982), examines mediating variables such as Quality Assurance and Accreditation Systems in the relationship of total quality management (TQM) practices and educational performance in higher education institutions in Pakistan. Within this context, the research tests several hypotheses, including both direct and indirect effects, using empirical data. The first hypothesis ($H_1$) posits that TQM practices have a significant, positive impact on educational performance in higher education institutions across Pakistan. The results suggest that educational performance heavily depends on the implementation of TQM practices that improve academic quality, administrative processes, and student satisfaction, ultimately enhancing the systems and processes within universities (Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). Numerous previous studies highlight the importance of quality management components, such as those found in TQM (Aichouni and Ferreira, 2024; Alhosani and Yaakub, 2025), in making organizational processes more effective and efficient. These findings align with previous research, such as that by (Gong et al., 2023; Kumar et al., 2020; Parinduri and Siregar, 2023), which found that organisational performance depends on the quality components within any institution. As quality components such as services, leadership, and customer satisfaction improve, organizational performance increases. Additionally, Abnoulgid et al. (2025) states that TQM plays a positive role in improving the performance of higher education institutions. Moreover, (Texeira-Quiros and Nunes, 2022) argue that leadership, including its vision, motivation, and skills, plays an integral role in enhancing the performance of any organisation. Similarly, top leadership in educational institutions plays a pivotal role in setting the vision for higher education institutions and aligning the organisation's objectives, strategies, and operational plans to ensure continuous improvement across all components of the university (Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). This continuous improvement should be evident in every aspect of the institution.

Furthermore, H2 examines the mediating role of quality assurance between TQM practices and education performance. The result indicates the significant mediating role of quality assurance between TQM practices and education performance. The results validates the prior research that also found that quality assurance plays a significant role in linking TQM practices to educational performance (Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). This finding explains the existence of a direct positive effect of TQM on educational performance but an even greater and more long-term effect when the practice also enhances the quality standards and monitoring systems and institutional systems, which, in turn, improves the overall performance of the organization (Elassy, 2022; Kumar et al., 2020). Simply put, quality assurance is an important channel through which the benefits of TQM practices can be systematically translated into measurable improvements in educational outcomes. Moreover, TQM practices also put a strong focus on the involvement of stakeholders, including faculty, students, administration, and external partners in decision-making procedures to guarantee continuous improvement in the organization (Addas, 2018; Iqbal et al., 2022). Such collaborative and inclusive practices are core to the creation of sound quality assurance policies, as they ensure that diverse institutional views are factored into quality monitoring and standard maintenance procedures. The active involvement of stakeholders will make quality assurance more receptive, dynamic, and more closely tied to the institution's real needs, thereby promoting more significant changes in educational performance (Hafeez et al., 2022).

Likewise, the reason quality assurance plays such a mediating role in this study is the growing focus on data-driven decision-making within higher education institutions. Colleges are currently using sophisticated analytics, key performance indicators, and institutional performance indicators to effectively track, assess, and enhance their academic and administrative activities. This move to evidence-based management lays a strong foundation for quality assurance models that will allow institutions to identify gaps, close them, and ensure long-term results (Elken and Stensaker, 2023). This has been more evident in areas where institutions of higher learning are experiencing a swift change due to technological advancements and globalization like in Pakistan where the Higher Education Commission (HEC) has been working hard to popularize the culture of quality in universities (Hussain et al., 2026).

Furthermore, $H_3$ also validates that the accreditation system plays a significant and a positive mediating role between TQM practices and educational performance. This finding provides a basis for understanding how TQM practices and the accreditation system as a whole can lead to high educational achievement in institutions of higher learning, thereby filling a significant gap in the current literature. As an inherently continuous improvement-related practice, transparency-based, and institutionally accountable approach, TQM practices directly boost the accreditation system in various organizational areas such as administration, faculty

development, research output, student affairs, and community engagement (Ab-Rahman and Kaharudin, 2025).

Therefore, accreditation standards require universities to maintain a constant commitment to quality and excellence, thereby earning the trust and confidence of key stakeholders, including students, parents, employers, and the public (Alfaridli and et al., 2024). When properly enforced, TQM practices can minimize the loss of track towards set quality standards and therefore institutions can achieve accreditation standards more efficiently and regularly. This both minimises institutional inefficiencies and enhances operational and strategic performance (Angwaomaodoko, 2025). In addition, external accreditation agencies provide stringent, objective feedback that universities can use to not only recognize their strengths but also to identify areas that need improvement. This outside thinking is invaluable, as it gives institutions a perspective that can be missed in internal analysis and helps them identify a potential untapped resource and opportunity that can be exploited to create a competitive edge in the higher education arena (Azizah, 2025).

Also, the accreditation system's mediating role is especially applicable in the Pakistani higher education context, where national regulatory bodies like the HEC have institutionalized accreditation-based regulations as a pillar of quality governance (Hinduja et al., 2023). Universities under these regulatory frameworks are strongly encouraged to ensure that TQM practices align with accreditation standards, thereby reinforcing a cycle in which quality management practices enhance accreditation outcomes and, consequently, improve educational performance (Hussain et al., 2026). This relationship aligns with prior research that found that TQM practices enhance the accreditation system, which ultimately leads to high institutional performance (Lucander and Christersson, 2020).

In addition to their respective mediating positions, this study also provides a strong, positive direct correlation between the accreditation system and quality assurance, thus strengthening the conceptual framework developed within the current study. Accreditation system is a strong indicator of quality assurance development in institutions of higher learning. By ensuring they comply with the recommendations by the accreditation council (including faculty credentials, student achievement, research output, involvement of alumni, and social responsibility) university are obliged to create and imprint certain quality standards in their organizational culture, structure, and routine operations (Alfaridli and et al., 2024; Ibrahim and Alaezi, 2023).

These institutionalized standards of quality are open to constant scrutiny, with corrective measures undertaken to ensure that the overall strategic goals set by the university leadership are met and sustained. This ongoing process leads to quality assurance appearing as a natural and reinforced consequence of a functional accreditation system. As such, the better and more comprehensive the accreditation system in a university is, the stronger and more reliable its quality assurance mechanisms, which eventually boost the university's overall image, reputation, and performance (Bedoll et al., 2021; Buetow and Wellingham, 2003).

This is also supported by the fact that accreditation systems provide improved micro-management in organizations and operational excellence is also attained at all levels and not just in individual faculty members or in the academic departments but in the whole institution (Acevedo-De-los-Ríos and Rondinel-Oviedo, 2022). The entire organization is guided towards a shared strategic purpose, making it significantly easier to achieve, track, and maintain quality standards over time (Kumar et al., 2020). When combined, the quality assurance and accreditation systems create a strong synergistic effect, forming a complete, holistic quality management framework that, in turn, reinforces both internal and external aspects of an institution's operations. Somewhere, quality assurance is aimed at assessing and enhancing internal processes; the accreditation system is external validation and benchmarking against international education standards. This complementary association results in high and sustainable educational performance, supporting the broader argument that TQM practices, when guided by these two mediators, have a much greater and longer-lasting influence on the educational performance of higher education institutions.

## 6. CONCLUSION AND IMPLICATIONS

### 6.1. Theoretical Implications

This study provides various important theoretical contributions to the existing body of knowledge in the field of TQM, organizational performance and higher education institutions. Quality assurance is the first contribution, serving as a mediating variable between TQM practices and educational performance overlooked in previous studies. This research bridges this gap by considering quality assurance as the mediator to develop a pathway/underlying mechanism to enhance (Crosling, 2017), education performance through TQM practices.

The second important contribution of this study is that accreditation systems serve as a mediator between TQM practices and educational performance, a factor that past studies did not consider as a pathway/underlying mechanism to both. The third critical contribution is the creation of a dual mediation pathways/underlying mechanisms which entails TQM practices, quality assurance, accreditation systems, and educational performance. This two-level mediation process identifies the processes involved in improving educational performance, especially in institutions of higher education in developing nations.

The fourth contribution, which has not been covered in the past literature, is an analysis of how accreditation systems affect quality assurance as perceived by educational institutions. Previous studies have not addressed this critical relationship, leaving a gap in the theoretical field. Although some studies have already been conducted on quality assurance and accreditation systems in relation to other variables (Alzafari and Ursin, 2019; Angwaomaodoko, 2025), not many have focused on how accreditation systems influence quality assurance. Hence, this research seeks to fill this gap.

The fifth theoretical contribution of the study is that it broadens the conceptual framework, particularly contingency theory and

social system theory, to the context of higher education and TQM practices. The contingency theory assumes that the internal and external factors should be aligned to ensure the effectiveness and performance of organizations (Marginson, 2025). This theory suggests that organizational performance cannot be optimized unless the management and balance of internal practices and external factors are handled. The contingency theory has been used to include the external factor, accreditation systems, in this study because they are necessary for establishing the quality domains required by external accrediting bodies. Quality assurance has been discussed as an internal process and practice, with emphasis on monitoring and evaluation.

The social system theory, which focuses on organisations as interconnected systems rather than isolated ones, is also incorporated into the study (Lackner, 2024). These components collectively make the organization competitive and enhance its performance. This study examines TQM practices, accreditation systems, and quality assurance as underlying mechanisms that enhance overall educational performance (Nguyen and Pham, 2023). Based on social system theory, this research establishes that quality assurance and accreditation systems are not independent variables but key components of the overall organizational process that enhances performance. This finding validates that TQM practices, quality assurance, accreditation systems, and educational performance form an integrated system in which these four components are strongly interconnected (Angwaomaodoko, 2025). By extending these theories, this research opens an interesting avenue for future exploration into how quality and accreditation, as integrated components, transmit the impact of TQM practices on educational performance.

## 6.2. Practical Implication

The findings of this research offer numerous practical applications for educational institutions. The top leadership of each institution, decision-makers, and those involved in strategic planning should first ensure that they establish a performance-driven vision and objectives clearly aimed at uplifting educational performance, as it significantly contributes to providing long-term directions of strategic positioning of university (Alfaridli and et al., 2024). To achieve this, top leadership should formulate effective strategies and policies that not only improve the system at the strategic level but also enhance it at the operational level, thereby improving universities' educational performance (Patton, 2024).

Additionally, policymakers should ensure the implementation of TQM practices while guaranteeing quality assurance through effective process control and improvement. These process controls will help meet the expectations of students and employees while simultaneously enhancing the university's infrastructure and facilities. This will result in improved service delivery from the university, including well-equipped libraries, laboratories, modern computers, and video players for simulation-based learning (Harvey and Williams, 2023; Iqbal et al., 2022). Policymakers design education programs that incorporate features to enhance interaction between students and industry. When designing programs, it is essential to consider industry needs and trends, as well as to provide appropriate faculty training to enhance students' knowledge and skills. Furthermore, policymakers should ensure the involvement of students and other stakeholders in developing an effective quality assurance and accreditation system. This will benefit the university by collecting and utilising diverse opinions and information, thereby increasing stakeholder involvement and ownership and improving socialisation and collaboration within the university.

Moreover, a recognition-and-rewards system should be implemented, taking into account employee involvement and performance, to ensure motivation and commitment to improving both individual and organisational performance. Alongside this, continuous training and skill-building programs should be organised to enhance further teaching quality, research quality, social performance, and other quality domains, such as student satisfaction, educational performance, alumni links, and societal collaboration. Policymakers and strategists should also focus on organizing effective accreditation series and workshops. These should aim to educate faculty and other employees involved in the accreditation system about its key domains and operational activities, and how they contribute to achieving accreditation. As the accreditation system is an external component, it presents various challenges for the organisation, requiring appropriate knowledge and preparation to address them. To address these challenges, the Higher Education Commission of Pakistan has made it mandatory for every university to establish a quality enhancement cell (QEC), which not only defines quality standards but also continuously monitors and evaluates them to facilitate their implementation.

The results also emphasize the role of quality assurance as an internal mechanism for monitoring and improving educational standards. Institutions can operationalize this by developing standardized procedures for curriculum development, faculty performance evaluation, and student feedback. Regular reviews of academic programs and administrative processes, guided by quality assurance frameworks, can identify gaps and areas for improvement. Furthermore, integrating feedback from students, alumni, and industry stakeholders into quality assurance practices ensures that institutional offerings remain relevant and responsive to evolving needs.

The mediating role of accreditation systems highlights their significance in translating TQM practices into tangible educational outcomes. Accreditation processes provide a structured pathway for embedding quality principles within institutions and ensuring alignment with global standards. Institutions should not view accreditation merely as a compliance exercise but as an opportunity for institutional growth and development. Collaboratively engaging with accrediting bodies and using accreditation findings to inform strategic planning can enhance the institution's overall effectiveness.

## 6.3. Limitations and Future Research Directions

Although this research follows a rigorous process from problem statement to data analysis tools, findings, and data interpretation, like other studies; it has several limitations that should be considered when reading the study and its results. The first limitation is that

this research examines educational performance within Pakistani universities. Therefore, the study has a geographical limitation (Khan et al., 2020). Future research can build on the current model by conducting cross-country comparative research, especially on higher education systems in developing and emerging countries. To gain a relevant understanding of various regulatory contexts, governance systems, and institutional capabilities regarding the effectiveness of TQM, quality assurance, and accreditation systems, it is possible to compare the practices for managing quality education in Pakistan with those of other countries in South Asia, the Middle East, or Southeast Asia. The comparative research would contribute to the literature on quality management in higher education and generate practical policy implications to enhance institutional performance across different educational settings.

Secondly, although this study accounted for common method bias and variance inflation factors during data analysis to ensure the data were free of these issues, the cross-sectional design may limit the ability to establish causal relationships. Therefore, it is recommended that future studies use a longitudinal research design to examine these variables across different contexts. A longitudinal design will enable a better understanding of the temporal dynamics and causal pathways between study variables (Akram et al., 2022) such as TQM practices, educational performance, accreditation systems, and quality assurance.

Moreover, this research examines two mediating factors, quality assurance and the accreditation system which themselves pose a potential limitation. Since the impact of TQM practices is diverse (Alhosani and Yaakub, 2025), other mediators may play a significant role in elucidating the underlying mechanisms of TQM practices and educational performance. Furthermore, this research took only one predictor in the form of TQM practices that provides a limited causal effect; there might be other crucial predictors that play a pivotal role to enhance educational performance, such organizational strategy, organizational flexibility and ambidextrous factors. In addition, this study has a limitation in that it collected responses only from top management at HEIs, as did previous studies (Akram and Ahmad, 2021; Akram et al., 2022). It may provide limited knowledge of higher education's performance dynamics and the implementation of TQM practices.

Moreover, this research only employed quantitative cross-sectional research design, future studies can use mixed-methods or qualitative research designs to supplement the quantitative results of this study. The contextual aspects of the practical challenges of implementing TQM practices and sustaining accreditation standards in universities can be depicted better through in-depth interviews, case studies, or focus group discussions with university administrators, quality assurance professionals, faculty members, and accreditation experts.

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