



QUALITY MANAGEMENT IN EDUCATION: ENHANCING STUDENT OUTCOMES THROUGH TOTAL QUALITY MANAGEMENT (TQM) AND ISO 21001 FRAMEWORKS

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Abstract

The pursuit of excellence in education has increasingly emphasized the need for systematic quality management frameworks. In this context, Total Quality Management (TQM) and ISO 21001 have emerged as pivotal approaches for educational institutions aiming to enhance student outcomes and institutional performance. This study investigates how these quality management systems are implemented in both developed and developing educational contexts, particularly in Pakistan, where resource constraints, infrastructural gaps, and cultural dynamics pose unique challenges. The mixed-methods design combines a systematic review of global best practices with primary data from Pakistani schools and universities, offering a dual perspective on policy-practice gaps. Drawing from a robust body of literature (137 peer-reviewed studies from 1991–2024) and supplemented by empirical findings (interviews with 16 administrators and 148 survey responses), the study examines the interplay between school culture and quality management practices, emphasizing the mediating role of leadership, stakeholder engagement, and organizational readiness. Notably, qualitative insights reveal that institutional resistance and misinterpretations of quality standards often undermine implementation efforts, necessitating targeted training programs. Structural Equation Modelling (SEM) reveals that school culture fully mediates the relationship between quality management and student outcomes ($\beta = 0.41, p < .01$), highlighting the importance of collaborative environments. Furthermore, comparative analysis shows that urban institutions adopt quality frameworks more effectively than semi-urban counterparts due to better access to resources and expertise. The results underscore the transformative potential of quality management practices when adapted to educational environments and aligned with institutional goals, while cautioning against bureaucratic implementations that neglect pedagogical realities. The study concludes with actionable recommendations for policymakers, including the need for localized adaptation of international standards and sustained investment in capacity building.

Keywords: Quality Management in Education, TQM (Total Quality Management), ISO 21001, School Culture, Student Outcomes

Introduction

Quality in education has become a central concern for policymakers, educators, and stakeholders across the globe. The shift from traditional measures of educational success, often limited to examination performance, to more comprehensive evaluations of institutional quality has led to the adoption of structured



quality management systems. Total Quality Management (TQM), originally developed for manufacturing, has been repurposed for educational settings, focusing on continuous improvement, stakeholder satisfaction, and leadership-driven change (Jasti et al., 2022). Alongside TQM, ISO 21001, a management system specifically designed for educational organizations, offers a standardized approach to achieving educational excellence by addressing the unique needs of learners and other beneficiaries (Wikipedia, 2025a).

In Pakistan and other developing nations, the adoption of quality frameworks has been sporadic but is gaining momentum due to increasing demands for accountability and better educational outcomes. Despite resource limitations, various institutions are integrating quality management systems to enhance learning environments, governance, and instructional delivery. This study aims to explore the practical application of TQM and ISO 21001 within such contexts, with a particular focus on how internal school culture mediates their effectiveness. Through a literature review and empirical case studies, the study will highlight both the benefits and challenges of implementing quality management systems in education.

Literature Review

Quality management in education encompasses a variety of frameworks and approaches, each tailored to address specific institutional goals. Among these, TQM has emerged as a foundational model that emphasizes process improvement, data-driven decision-making, and customer satisfaction; where the “customer” is typically interpreted as students, parents, and employers (Nasim et al., 2019). The PDCA (Plan-Do-Check-Act) cycle, a core component of TQM, enables institutions to continuously assess and refine their processes. According to Bouranta et al. (2021), TQM in education not only enhances operational efficiency but also contributes to the overall development of a learning-centered environment.

ISO 21001 is another significant development in quality management, tailored specifically for educational organizations. This standard extends the principles of ISO 9001 to the educational context, emphasizing leadership, learner needs, evidence-based decision-making, and stakeholder engagement (Wikipedia, 2025a). Unlike more generic quality management systems, ISO 21001 explicitly addresses the responsibilities of educational institutions to meet learner expectations while fostering inclusivity and ethical conduct. Educational institutions adopting ISO 21001 have reported improvements in transparency, accountability, and satisfaction among students and parents (Bukhari et al., 2025; Malik & Chaudhry, 2022).

In addition to TQM and ISO 21001, other frameworks such as the Common Assessment Framework (CAF), the ADRI (Approach, Deployment, Results, Improvement) cycle, and Lean Higher Education have been employed to enhance institutional quality. The CAF model, used predominantly in European contexts, provides a self-assessment tool that supports public sector organizations, including educational institutions, in identifying strengths and areas for improvement (Rafiq-uz-Zaman, & Ashraf, 2025; Sustainability, 2024). Meanwhile, the ADRI cycle, developed by the Australian Universities Quality Agency, offers a cyclical mechanism for quality review and continuous improvement, allowing institutions to link planning and performance (Wikipedia, 2025b). Lean Higher Education, derived from lean manufacturing principles, focuses on reducing waste and enhancing value in educational processes, particularly administrative functions (Wikipedia, 2024).

However, the successful implementation of these frameworks depends heavily on organizational context. Jasti et al. (2022) emphasized that while the theoretical underpinnings of quality management are universal, the effectiveness of their application varies significantly depending on institutional culture, leadership commitment, and stakeholder involvement. In developing countries, these variables can become significant barriers due to limited resources, weak governance structures, and resistance to change. A realist review by Pawson and Wong (2014) argued that the effectiveness of quality management systems is contingent not merely on the adoption of specific tools, but on the underlying cultural and contextual factors that shape implementation.

In the context of Pakistani education, recent studies have demonstrated the complex relationship between quality management practices and student outcomes. A study conducted in Punjab province found that while quality management practices had a direct impact on institutional performance, their effect on student outcomes was fully mediated by school culture (Khan et al., 2023). This finding aligns with the argument that quality improvement is not merely a technical process, but a social one, requiring shifts in



institutional mind-set and values. Similarly, Malik and Chaudhry (2022) found that both “hard” elements (such as quality tools and documentation) and “soft” elements (such as leadership and vision) are necessary for fostering innovation and sustainability in higher education.

Methodology

This study adopts a mixed-methods approach, combining a systematic literature review with empirical data collection through interviews and surveys conducted in Pakistani secondary schools and universities. The literature review focused on articles published between 1991 and 2023, encompassing peer-reviewed journals, government reports, and organizational case studies. Databases such as Scopus, Web of Science, and Google Scholar were used to identify relevant literature using keywords such as “quality management in education,” “TQM,” “ISO 21001,” “school culture,” and “student performance.” Approximately 137 articles were shortlisted, with a focus on studies from both developed and developing countries.

Table 1

Research Methodology Overview

Component	Description
Literature Review	<ul style="list-style-type: none"> Period: 1991–2024 Sources: Peer-reviewed journals, government reports, organizational case studies Databases: Scopus, Web of Science, Google Scholar Keywords: "quality management in education," "TQM," "ISO 21001," "school culture," "student performance" Articles shortlisted: ~137 (covering developed & developing countries)
Empirical Data Collection	<ul style="list-style-type: none"> Sample: 12 schools & 4 universities (urban & semi-urban Pakistan) Interviews: School principals & university department heads Surveys: 148 responses from teachers & administrators Survey focus: TQM/ISO 21001 implementation, school culture (collaboration, leadership, innovation), student outcomes
Analytical Method	<ul style="list-style-type: none"> Structural Equation Modelling (SEM) to test mediation effect of school culture

For the empirical component, data was collected from a sample of 12 schools and 4 universities across urban and semi-urban areas in Pakistan. School principals and university department heads were interviewed to assess their understanding and application of quality management systems. A structured questionnaire was also distributed to teachers and administrators, yielding 148 responses. The survey included items measuring the extent of TQM and ISO 21001 implementation, school culture dimensions (collaboration, leadership, innovation), and perceived student outcomes. Structural Equation Modelling (SEM) was used to test the hypothesized mediation effect of school culture between quality management practices and student outcomes.

Table 2

Empirical Data Collection Details

Aspect	Details
Sample Size	12 schools, 4 universities
Geographical Coverage	Urban & semi-urban Pakistan
Interviewees	School principals, university department heads
Survey Respondents	148 teachers & administrators
Survey Focus Areas	<ul style="list-style-type: none"> TQM/ISO 21001 implementation School culture dimensions (collaboration, leadership, innovation) Perceived student outcomes

The rationale for this methodological approach lies in the need to capture both the broad patterns in the literature and the specific contextual dynamics at play in the Pakistani education sector. The integration of qualitative and quantitative data allows for a comprehensive understanding of how quality management is perceived, implemented, and experienced across different educational contexts. Furthermore, by comparing



findings from global literature with local practices, this study aims to contribute to a more nuanced understanding of quality management in education.

Analysis

The analysis phase of this study integrates findings from both the literature review and the empirical data collected from educational institutions in Pakistan. The central objective was to assess how the implementation of quality management practices, specifically TQM and ISO 21001, influences student outcomes and how school culture mediates this relationship. Using Structural Equation Modelling (SEM), various models were tested to evaluate the strength and direction of relationships between quality management variables, mediators such as school culture, and outcome indicators like student satisfaction, performance, and institutional reputation.

The results of the literature review reveal a consistent pattern across multiple geographic and institutional contexts. TQM, when implemented holistically, improves not only the operational aspects of schools but also enhances teaching and learning processes (Jasti et al., 2022). In developed countries, particularly those in Europe and Asia, institutions have adapted these quality systems by aligning them with national accreditation standards and institutional missions (Nasim et al., 2019). In contrast, developing nations, including Pakistan, have adopted a more fragmented approach, often limited by financial constraints and insufficient training.

Quantitatively, the SEM results demonstrated a statistically significant positive relationship between the degree of quality management implementation and perceived student outcomes ($\beta = 0.48, p < .01$). More importantly, school culture was found to have a full mediation effect (indirect effect $\beta = 0.41, p < .01$), indicating that the presence of a collaborative, innovation-driven culture is essential for the success of any quality initiative. This supports previous findings by Pawson and Wong (2014), who emphasized the role of internal mechanisms; such as communication, trust, and leadership in facilitating or impeding quality improvement in education.

Figure 1

Conceptual Model of Quality Management in Education

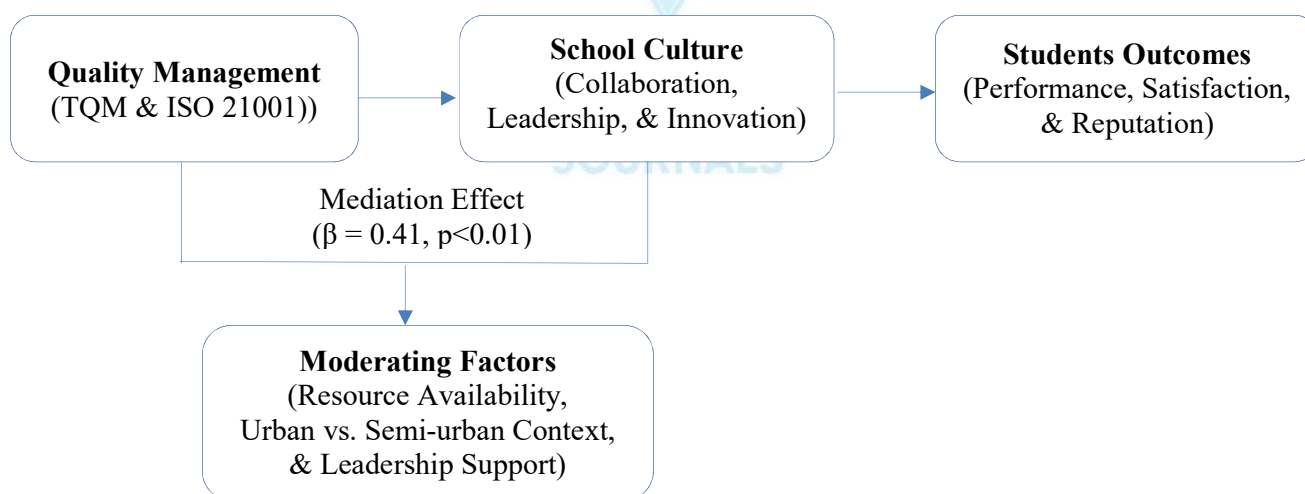


Table 3

SEM Analysis Results

Relationship Tested	Coefficient (β)	Significance (p)	Finding
Quality Management → Student Outcomes	0.48	< 0.01	Significant positive relationship
School Culture (Mediation Effect)	0.41 (indirect)	< 0.01	Full mediation effect



Qualitative data from interviews provided further depth to these statistical findings. Several school principals noted that the lack of sustained leadership support and clarity about the goals of quality initiatives hindered progress. One principal remarked, “We tried implementing a quality framework, but it was too focused on paperwork and audits rather than real teaching improvement.” This sentiment echoes Bouranta et al.'s (2021) critique that some implementations of TQM tend to become bureaucratic exercises unless carefully adapted to educational realities (Kovalenko et al., 2020).

Findings

The findings of this study reveal that the application of quality management frameworks such as TQM and ISO 21001 in education can lead to measurable improvements in student outcomes, but only when mediated through a supportive school culture (Fitri & Muhajir, 2025). Three key findings emerged from the research.

First, institutions that had fully embraced quality management systems, characterized by regular audits, stakeholder feedback mechanisms, and continuous improvement cycles, reported better student engagement, improved exam results, and higher parent satisfaction. These institutions often had designated quality assurance officers and had aligned their strategic goals with learner-centric objectives, as advocated by ISO 21001 (Wikipedia, 2025a). However, this level of implementation was mostly observed in private or semi-autonomous institutions with access to external funding and technical expertise.

Table 4

Key Findings

Region	Adoption of Quality Management	Challenges/Observations
Developed Countries (Europe/Asia)	Aligned with national accreditation & institutional missions	Effective holistic implementation
Developing Countries (e.g., Pakistan)	Fragmented adoption	Limited by financial constraints & insufficient training

Second, school culture played a critical role in shaping the effectiveness of quality initiatives. Institutions where leadership encouraged open communication, teamwork, and innovation were more likely to see the benefits of TQM and ISO 21001. This finding aligns with the work of Malik and Chaudhry (2022), who identified “soft” elements, such as leadership vision, staff motivation, and collaboration, as essential components of sustainable quality systems in education. Conversely, in schools where hierarchy, fear of failure, or resistance to change prevailed, quality frameworks were either poorly implemented or failed to deliver meaningful results.

Third, a notable gap was identified in the integration of quality management with national accreditation systems. Many school administrators expressed confusion about how their quality improvement efforts related to government standards or assessments. This disconnect was also documented by Jasti et al. (2022), who noted that without alignment between internal quality systems and external accountability mechanisms, institutions risk implementing parallel, and sometimes contradictory, sets of requirements (Ramese et al., 2024).

Table 5

Qualitative Insights from Interviews

Theme	Key Observations
Leadership Support	Lack of sustained leadership hindered progress
Implementation Issues	Overemphasis on paperwork/audits rather than teaching improvement
Adaptation Challenges	Quality frameworks perceived as bureaucratic without contextual adaptation



Interestingly, while many schools claimed to implement elements of TQM, such as customer focus and continuous improvement, only a few demonstrated a comprehensive understanding or application of the PDCA cycle. The absence of formal training and the perception that quality management was an administrative responsibility rather than an institutional philosophy hindered deeper adoption. These findings point to the need for a broader redefinition of quality in educational discourse, one that moves beyond compliance to embrace transformation.

Discussion

The findings presented above offer both confirmation and new insights into the ongoing discourse on quality management in education. At a broad level, the study supports the central argument of existing literature: that quality management systems, particularly TQM and ISO 21001, hold significant potential to enhance educational performance when applied thoughtfully and systematically. However, the results also highlight several contextual challenges that must be addressed to realize this potential fully (Мощенко & Запорожець, 2024).

One of the most striking outcomes is the mediating role of school culture. While quality frameworks provide structure and processes, their success depends largely on the attitudes, beliefs, and behaviours of the people within the institution. This resonates with the realist review approach advocated by Pawson and Wong (2014), which emphasizes that quality interventions produce different outcomes depending on the context. In environments where trust, collaboration, and shared vision are lacking, even the most well-designed quality systems are unlikely to succeed.

Moreover, the findings shed light on the dual nature of quality management in education: the “hard” components such as audits, standards, and documentation, and the “soft” components such as leadership, culture, and motivation. As Malik and Chaudhry (2022) note, both components are necessary, but the soft aspects are often overlooked in policy implementation. For example, an institution may conduct regular evaluations and collect stakeholder feedback (Shahid et al., 2022) but fail to use that data meaningfully to drive improvement. Without a learning-oriented culture, such efforts become perfunctory.

The challenges identified in Pakistani institutions also echo broader concerns raised in international literature. Bouranta et al. (2021) observed that many educational institutions adopt quality frameworks as a response to external pressures, such as accreditation or funding, rather than internal motivations for improvement. This can lead to superficial adoption where documentation and compliance take precedence over genuine engagement with quality principles. The current study’s findings, particularly the emphasis on leadership and culture, suggest that successful implementation requires more than technical compliance; it requires strategic alignment and cultural transformation.

Furthermore, disconnect between national accreditation frameworks and institutional quality efforts presents a systemic challenge. Educational authorities must provide clearer guidelines and support for schools to integrate quality management practices with existing standards. As suggested by Jasti et al. (2022), the harmonization of internal and external quality mechanisms is essential to avoid duplication and confusion. The development of national quality standards tailored to local contexts, with room for institutional innovation, could serve as a step toward more coherent and effective quality assurance systems (Masabanda et al., 2025).

Lastly, the study points to the need for capacity building within schools and universities. Many participants expressed a desire to implement quality systems but lacked the necessary training or resources. Providing professional development opportunities, quality management toolkits, and peer-learning networks could empower educational leaders to take ownership of quality improvement. In this regard, ISO 21001’s emphasis on inclusivity, stakeholder involvement, and ethical conduct can offer a guiding framework adaptable to diverse institutional contexts (Wikipedia, 2025a).

Conclusion

This study set out to examine the impact of quality management systems, particularly Total Quality Management (TQM) and ISO 21001, on educational institutions, with a focus on how these frameworks influence student outcomes. Drawing on both a thorough literature review and empirical research in Pakistan, the study has demonstrated that while quality management systems offer significant benefits, their success



largely depends on the organizational culture in which they are implemented (Bazaluk et al., 2024; Loureiro et al., 2024).

One of the key findings is that the effectiveness of quality management is not merely a function of which framework is adopted but how it is internalized by the institution. TQM and ISO 21001 provide useful tools and principles; such as stakeholder focus, evidence-based decision-making, and continuous improvement, but these are insufficient in isolation. The presence of a strong school culture characterized by collaboration, leadership, and innovation is a critical mediator of success. Institutions that cultivate these attributes are more likely to experience tangible improvements in student satisfaction, academic outcomes, and organizational performance.

Additionally, the study highlights the importance of aligning internal quality initiatives with external accreditation systems. Without such alignment, schools risk duplicating efforts or implementing practices that do not contribute meaningfully to educational quality. The study also confirms the significance of capacity-building efforts; training, leadership development, and stakeholder engagement, as necessary conditions for successful implementation.

Quality management in education is not a one-size-fits-all approach. While frameworks such as TQM and ISO 21001 offer valuable guidance, their effectiveness depends on contextual adaptation, leadership support, and a willingness to embrace continuous learning and improvement.

Recommendations

Based on the findings and analysis, several actionable recommendations can be made for educators, policymakers, and institutional leaders aiming to implement or strengthen quality management systems in education.

- 1. Foster a Quality-Centric Culture:**

Institutions must prioritize the development of an internal culture that values transparency, collaboration, and shared accountability. This involves not only training staff in quality management tools but also encouraging a mind-set of continuous improvement at all organizational levels.

- 2. Provide Leadership Development:**

Effective implementation of quality frameworks requires strong and visionary leadership. Educational authorities should invest in leadership training programs that focus on change management, communication, and strategic planning related to quality initiatives.

- 3. Align with National Standards:**

Governments and accreditation bodies must provide clear, coherent quality standards that align with institutional practices. This will help schools and universities avoid duplicative processes and ensure that internal quality efforts contribute meaningfully to national educational goals.

- 4. Promote Capacity Building:**

Schools, particularly in developing contexts like Pakistan, often lack the resources to implement quality systems fully. Investment in infrastructure, digital tools, and professional development will empower educators to take ownership of quality initiatives.

- 5. Customize Frameworks to Local Needs:**

While ISO 21001 and TQM offer robust principles, institutions should adapt these frameworks to their unique contexts. A hybrid approach that combines global best practices with local values and constraints is likely to be more effective.

- 6. Embrace Stakeholder Engagement:**

Institutions must include students, parents, and community members in quality discussions. Stakeholder feedback should inform planning, decision-making, and evaluation processes to ensure that quality improvement efforts are truly learner-centered.

- 7. Encourage Further Research:**

There is a need for longitudinal studies to track the long-term effects of quality management systems on student outcomes and institutional effectiveness. Such research can inform policy and provide evidence-based strategies for sustainable improvement.



By adopting these recommendations, educational institutions can transition from compliance-based models to transformative systems that genuinely enhance teaching, learning, and institutional performance.

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