QUALITY PAPER

Optimizing quality enhancement cells in higher education institutions: analyzing management support, quality infrastructure and staff training

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Abstract
Purpose – This study aims to investigate the relationship between management support, quality infrastructure, staff training and the effectiveness of quality enhancement cells (QECs) established in higher education institutions.
Design/methodology/approach – Data were acquired via a structured questionnaire dispatched to faculty members across 12 public and private universities, primarily situated in Punjab, Pakistan. Among the 200 questionnaires distributed, 180 were retrieved and 140 were deemed valid. The proposed relationships were examined using SPSS–25 and PLS–SEM.
Findings – The results show a positive and significant relationship between management support, quality infrastructure and staff training with QECs’ effectiveness. The study also highlights that the effectiveness of QECs is “Good” in only two of the 12 universities, while in most universities it is “Barely Acceptable”. Furthermore, QECs’ effectiveness is slightly better in public universities compared to private institutions.
Research limitations/implications – The study employs convenience sampling and a cross-sectional approach, focusing on faculty members from 12 universities, primarily in Punjab, Pakistan. To enhance future research, larger samples and probability-based sampling should be considered, while involving quality managers and students for a broader perspective.
Practical implications – The research suggests policymakers and university leaders should strengthen their support by providing resources, quality infrastructure and training for academic and administrative staff. This would enhance the effectiveness of QECs and improve the overall quality of education in both public and private universities.
Originality/value – This study contributes to the literature on quality assurance in higher education by emphasizing the significance of QECs concerning management support, quality infrastructure and staff training – areas that are often overlooked in Pakistani universities.
Keywords Quality enhancement cells, Higher education institutions, Management support, Quality infrastructure, Staff training
Paper type Research paper

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1. Introduction

Quality has emerged as a buzz-worthy and impactful business strategy across diverse sectors, providing them a competitive edge (Iqbal et al., 2022; Wanza et al., 2017). Such definitions of quality encompass a high degree of goodness, a distinctive characteristic or attribute, a high degree of excellence, a high social status, an authorized level of superiority, and a regularized, accepted, predetermined, and correct level of competence and performance (Taib and Mohammad, 2019). Over the past two decades, integrating quality assurance (QA) into higher education (HE) has gained traction. QA can be defined as “a summative approach that aims to improve the quality of academic programs and institutions using external standards and quantitative measures for assessment and accountability” (Iqbal et al., 2023b). In today’s context, integrating quality into HE while maintaining its effectiveness presents a common global challenge for universities. The issue of educational quality is of paramount importance, as Higher Education Institutions (HEIs) bear responsibility towards a multitude of stakeholders, including students, society, and various others (Nadim and Al-Hinai, 2016). Overlooking QA carries significant consequences for national progress, given HE’s pivotal role in shifting from a low-wage economic framework to achieving heightened performance levels (Mohammed et al., 2016).

Several studies have identified potential factors affecting the effectiveness of QA. For instance, Seyfried and Pohlenz (2018) argued that “support by HEIs’ management and cooperation with other education institutions are relevant preconditions for larger perceived degrees of QA effectiveness”. Similarly, Drogalas et al. (2015) highlighted key factors like internal audit quality, competence of the internal audit team, independence of internal audit, and management support as vital for boosting the effectiveness of internal audits. Visscher and Hendriks (2009) identified pivotal factors that influence QA effectiveness. Enabling factors encompass the design process, QA procedures, dedicated staff, well-defined QA goals, staff motivation to enhance student and QA performance, performance-oriented pressure, principal’s endorsement, and school size. Conversely, constraining factors encompass the lack of innovative resources, inadequate user training, limited staff involvement in QA, and inadequate intrinsic rewards for QA staff.

Roshani et al. (2019) included administrative/managerial support, infrastructure, and staff training as part of the 18 factors in the educational framework specific to the Indian context, named “design characteristics”. However, the study’s outcomes can’t be broadly applied since it solely considered the viewpoints of administrative staff. Yarahmadi and Magd (2016) underscored training’s pivotal role in preparing universities for total quality management. Recent research has highlighted the essential contribution of university leaders in nurturing a culture of quality within universities (Iqbal et al., 2023b). Similarly, Tung et al. (2011) linked top management support, training, employee involvement, and performance-based incentives to effective performance management systems. Additionally, Mishra and Kushwaha (2016) identified various quality factors for both HE and organizational management, with particular attention to infrastructure and learning resources.

Considering factors examined in prior QA effectiveness studies, a significant lack of substantial evidence exists concerning the efficacy of quality enhancement cells (QECs) in HE. Acknowledging the importance of QECs, Pakistan’s higher education commission (HEC) has mandated their establishment in all universities, emphasizing improved higher education quality. This initiative aims to enhance public confidence, maintain degree standards, and ensure the quality of education offered by institutions (Batool and Qureshi, 2007). Due to the limited empirical evidence regarding the intricate interplay of management support, quality infrastructure, staff training, and QEC effectiveness, the study presents the following two research questions (RQs):

**RQ1.** To what extent are faculty members satisfied with the effectiveness of QECs in universities?
RQ2. What is the relationship between management support, quality infrastructure, staff training and the effectiveness of QECs in universities?

The paper is organized as follows: It starts with an extensive literature review on quality assurance in HEIs, addressing both global perspectives and the distinct Pakistani context. This is followed by a discussion on the effectiveness of QA and QECs in relation to the mentioned factors. The paper then discusses the selected research methodology and outlines the survey instrument used for data collection. Finally, the study’s findings are presented, followed by a discussion, study implications, limitations, and conclusion.

2. Literature review and hypotheses

2.1 Quality assurance in higher education institutions (HEIs)

The concept of QA in HE is discussed in literature in many ways. QA encompasses a range of policies, procedures, and endeavors aimed at upholding and advancing quality. Predominantly, two distinct approaches to QA are recognized within the realm of HE. According to McKimm (2000), accountability and enhancement are important motives for QA. One interpretation characterizes QA as "the processes of evaluating (assessing and monitoring), maintaining, guaranteeing, and improving the quality of the HE system, institution, or program" (Wysocka et al., 2022). Dill (2010) defined internal quality assurance (IQA) as "those policies and practices whereby academic institutions themselves monitor and improve quality of their education provision, while external quality assurance (EQA) refers to supra-institutional policies and practices whereby quality of HEIs and programs are assured". It is generally believed both QA approaches need to be implemented for enhancing quality in HE. Danø and Stensaker (2007) argued “QA is often advocated as part of a balance between external control and internal improvement”. Regardless of the QA approach adopted by top management, the key factor is its effective execution. This is emphasized by numerous researchers who highlight the importance of implementing quality standards adeptly to achieve system maturity and sustained improvement (Iqbal et al., 2023c, d; Moosa et al., 2010).

2.2 Effectiveness of QECs in universities

Vlasceanu et al. (2007) defines effectiveness as “an output of specific analyses that measure (quality of) achievement of a specific educational goal or degree to which a HEI can be expected to achieve specific requirements. They further argued it is different from efficiency, which is measured by volume of output or input used”. The HEC of Pakistan, an autonomous institution established by the constitution, is responsible for funding, regulating, overseeing, and accrediting HE initiatives. HEC has assigned responsibility to QECs established in Pakistani universities to implement and uphold QA standards. HEC’s QA model operates through two domains: firstly, IQA entails self-assessment and internal audits within universities, and secondly, EQA covers program accreditation and evaluation of institutional performance by HEC’s dedicated Quality Assurance Agency (Batool and Qureshi, 2007). QECs function as QA departments in Pakistani universities. They ensure compliance with quality standards, review academic affiliations, set clear standards, design qualification frameworks, outline program specifications, create QA procedures, and ensure effective QA processes while boosting academic staff capabilities (Batool and Qureshi, 2007). Against this backdrop, the effectiveness of QECs can be evaluated by their level of engagement in the self-assessment of academic programs, contribution to decision-making to uphold academic quality, and enhancement of confidence and satisfaction among various university stakeholders.

Despite QECs’ significant role in universities, there’s limited evidence on their impact in enhancing academic quality in Pakistani institutions. While one study suggests that the Quality Assurance Agency’s efforts may have improved quality assurance mechanisms and academic programs (Usmani and Khatoon, 2016), its reliance on secondary data limits...
applicability. In contrast, most researchers hold that substantial improvements remain elusive (Banuri, 2021; Hoodbhoy, 2009; Iqbal et al., 2022; Iqbal et al., 2023b, c, d). This aligns with the 2023 QS World University Rankings, where only seven Pakistani universities make the top 1,000 (QS, 2023). The absence of empirical backing for QECs’ efficacy in Pakistan underscores the necessity for further research.

2.3 Management support and QECs’ effectiveness

Strong support from top management greatly influences the success of quality departments and their practices in diverse organizations, including universities. Simultaneously, faculty members are vital contributors to teaching, research, and administrative functions. Dukhan et al. (2017) established a connection between management support and heightened employee performance, emphasizing how dedicated faculty members’ enthusiastic commitment to their educational roles contributes to better student outcomes. In essence, QA systems’ effectiveness hinges on faculty motivation and satisfaction. Recent studies highlight faculty motivation’s vital role in fostering a quality-centered culture, ultimately improving university quality and performance (Iqbal et al., 2023a, c).

Previous research highlights the positive impact of leadership/management on cultivating quality work culture (Ali et al., 2015; Anwar, 2020), improving employee job performance (Torlak and Kuzey, 2019), and enhancing service quality (Wijaya et al., 2019) in HE. Management support is vital for creating an environment aligned with organizational goals (Zangaro, 2001; Giffords, 2009). Praraksa et al. (2015) show that administrators’ instructional leadership significantly influences IQA’s operational efficiency. Recent studies emphasize leadership’s crucial role in nurturing quality culture in universities. However, the relationship between management support and QECs’ effectiveness in universities is underexplored. Building on these insights, we propose the following hypothesis:

H1. There is a positive and significant relationship between management support and QECs’ effectiveness.

2.4 Quality infrastructure and QECs’ effectiveness

Prior studies have delved into diverse viewpoints when defining quality infrastructure. For instance, Aswal (2020) portrays quality infrastructure as an “invisible force” that connects government, universities, science and technology institutions, civil society, media, and enterprises, all contributing to economic growth and enhanced quality of life. Conversely, some researchers contend that quality infrastructure encompasses “all aspects of metrology, standardization, testing, and quality management including certification and accreditation. This includes both public and private institutions and regulatory framework within which they operate” (Sanetra and Marbán, 2007; Wipplinger et al., 2006). Moljevic (2016) underlines quality infrastructure’s significance in improving quality and supporting regional development, calling for more research in this area. Ruso et al. (2015) stress quality infrastructure’s role in enabling organizations to compete regionally and internationally, meet stakeholder needs, and handle risks. This applies to public and private institutions within regulatory frameworks. Patyal and Kollakunta (2017) also discovered that infrastructure quality management practices have a positive impact on core quality practices and indirectly affect the quality performance of Indian manufacturing firms. Sallis (2002) created a quality indicator checklist for HE, outlining essential physical environment and facility requirements. This includes factors like infrastructure development, facility adequacy, student-friendly features, maintenance, international standards, and safety. However, while quality infrastructure has been studied extensively in manufacturing, there’s no evidence in previous research investigating the link between quality infrastructure and
the effectiveness of QECs in higher education. This leads to the formulation of the following hypothesis.

**H2.** There is a positive and significant relationship between quality infrastructure and QECs’ effectiveness.

### 2.5 Staff training and QECs’ effectiveness

Staff training significantly boosts organizational performance. It’s a methodical, planned effort to enhance employees’ knowledge, skills, and attitudes, resulting in better job performance (Buckley and Caple, 2009; Shipton *et al.*, 2005; Tharenou *et al.*, 2007). Additionally, Smith (2010) asserts that training promotes employee motivation, productivity, and innovation. Trained employees show increased capabilities, autonomy in roles, decreased supervision needs, adept customer interactions, job comprehension, fewer complaints, elevated job satisfaction, and motivation, ultimately fostering positive employee-management relationships. Prior research has examined staff training from various perspectives, resulting in diverse findings. Notably, certain studies have established a positive connection between staff training and factors like employees’ performance and skills, organizational effectiveness, productivity, and performance, as well as innovation (Al-Mzary *et al.*, 2015; Ali and Hussain, 2014; Daniel, 2018; Nebo *et al.*, 2015; Omosa *et al.*, 2018; Rahman *et al.*, 2013; Smith, 2010). Conversely, a few studies have reported non-significant associations involving staff training. For example, a study at Rongo University in Kenya found no impact of staff training on lecturers’ academic performance, likely due to limited training opportunities (Chemutai and Khalili, 2022). However, the study’s exclusive focus on a single university hinders its broader applicability. Similarly, another investigation across 10 businesses in Southern China indicated that training’s direct influence on customer service quality was not statistically significant (Shen and Tang, 2018). Given these inconsistent results and the lack of empirical evidence regarding the connection between staff training and the effectiveness of QECs, the following hypothesis is put forth.

**H3.** There is a positive and significant relationship between staff training and QECs’ effectiveness.

### 2.6 Research framework

This study is anchored in the resource-based view (RBV) theory, based on the gaps identified in the literature. The RBV theory underscores the leverage of internal resources that are esteemed for their rarity, distinctiveness, and irreplaceability, aimed at securing a competitive edge (Barney, 1991). The broad acknowledgment of RBV’s applicability across diverse sectors, including HE, empowers organizations to harness their internal resources (Iqbal *et al.*, 2023a, b, c, d; Khaw and Teoh, 2023; Muangmee *et al.*, 2021). Within this RBV framework, the present study regards management support, quality infrastructure, and staff training as invaluable assets within universities, augmenting the effectiveness of QECs. The proposed framework integrates three independent variables (management support, quality infrastructure, and staff training) alongside a dependent variable (QECs’ effectiveness), as depicted in Figure 1.

### 3. Research methodology

#### 3.1 Research design

This study adopted a quantitative approach using surveys within a cross-sectional research design. The survey-based methodology carries notable advantages, encompassing diverse geographical areas, adhering to ethical standards, and providing efficiency in terms of cost-
effectiveness and swift data collection (Creswell, 2014; Fowler, 2014). Similarly, the selection of a cross-sectional approach aligns well when capturing data at a specific time point (Sekaran and Bougie, 2016), as it reduces time, cost, and effort.

3.2 Sample and procedure
The study focused on permanent faculty members from public and private universities in Pakistan. Given the large population, a convenience sampling approach was chosen due to the impracticality of randomization (Etikan et al., 2016). Data were collected from 12 universities located in major Pakistani cities like Lahore, Karachi, Islamabad, and Gujrat, using both in-person and online surveys. Out of 200 distributed questionnaires, 140 were given in-person and 60 were administered online. In total, 180 responses were received: 125 from in-person and 55 from online respondents. However, 40 questionnaires were excluded due to incompleteness (29 in-person) or a uniform response pattern (11 online). The study achieved an overall valid response rate of 70.95%. Additionally, the sample size’s sufficiency was assessed using G*Power 3.1.9.7 software, following recommendations from prior studies (Erdfelder et al., 1996; Faul et al., 2009), and to ensure representation of the study population (Aljuhmani et al., 2021). A priori analysis indicated that a minimum of 99 participants would provide a statistical power of 0.90 for the structural model, with a significance level of 0.05 and a moderate effect size of 0.15 (Memon et al., 2020). The actual sample size of 140 participants surpassed this requirement for hypothesis testing. Detailed information about the sampling process can be found in Table 1.

3.3 Measures
The questionnaire was structured using a 5-point Likert scale, adapting items for three independent variables (management support, quality infrastructure, and staff training), and one dependent variable (QECs’ effectiveness). These items were sourced from existing literature and HEC manuals, including the QA Manual for HE in Pakistan (Batool and Qureshi, 2007), and the Self-Assessment Manual (Raouf, 2006). To ensure appropriateness and minimize bias, a preliminary questionnaire was pre-tested as recommended by researchers (Sekaran and Bougie, 2016).
Bougie, 2016), with two experts, one with cross-sectorial TQM implementation experience and the other a senior professor engaged in teaching, research, and quality assurance activities in a Pakistani university. Based on their feedback, a few items were adjusted for clarity. Additionally, a pilot test involved 25 faculty members permanently employed by three universities. A reliability test using Cronbach’s alpha was conducted to assess the internal consistency of the measurement scale, yielding acceptable values within the range of 0.66–0.77. The final questionnaire comprised 21 items: seven each for management support and quality infrastructure, four for staff training, and three pertaining to QECs’ effectiveness. Detailed item information and references can be found in Appendix A.

4. Data analysis and results
The data analysis was conducted in two stages. Firstly, data cleansing and assessment of normality were executed, alongside identification of non-response and common-method biases. This was followed by descriptive analysis using SPSS-25 and Microsoft Excel. Secondly, in the subsequent stage, the data underwent analysis utilizing partial least squares structural equation modeling (PLS-SEM) through Smart PLS 4 software.

To begin with, data cleaning was conducted, leading to the removal of 40 completed questionnaires (29 due to substantial incompleteness and 11 due to consistent straight-line responses). Subsequently, data normality was assessed using the Shapiro–Wilk and Kolmogorov–Smirnov tests, following established practices by previous researchers (Kim, 2013; Razali and Wah, 2011). Both tests yielded p-values below 0.05, thus rejecting the null hypotheses (H0) and indicating non-normal data distribution. This aligns with expectations, as smaller sample sizes commonly result in non-normal distributions (Field, 2018; Hwang et al., 2018; Shan et al., 2017). Subsequently, an independent sample t-test was utilized in accordance with Armstrong and Overton’s (1977) recommendation. Its purpose was to assess potential differences between responses gathered through distinct modes, namely in-person and online surveys. To facilitate this, the dataset was divided into two groups: in-person (96 responses) and online (44 responses). The results showed no significant mean score differences between in-person responses (management support: $t(138), M = 3.67, SD = 0.688, p = 0.637$), (quality infrastructure: $t(138), M = 3.567, SD = 0.757, p = 0.969$), (staff training: $t(138), M = 3.422, SD = 0.830, p = 0.881$), (QEC: $t(138), M = 3.458, SD = 0.965, p = 0.752$) and online survey responses (management support: $t(138), M = 3.610, SD = 0.686, p = 0.637$), (quality infrastructure: $t(138), M = 3.562, SD = 0.684, p = 0.969$), (staff training: $t(138), M = 3.398, SD = 0.993, p = 0.881$), (QEC: $t(138), M = 3.515, SD = 1.025, p = 0.752$). Hence, the null hypothesis (H0) was supported, implying similarity between in-person and online responses. The summarized results of the independent samples t-test are presented in Table 2.

4.1 Common-method bias (CMB)
Moreover, the study assessed the CMB as suggested by Podsakoff et al. (2003). Initially, Harman’s one-factor test was applied, revealing that only 47.32% of the variance could be explained by a single factor. This falls short of the 50% threshold, indicating that CMB was

<table>
<thead>
<tr>
<th>Mode</th>
<th>Distributed</th>
<th>Received</th>
<th>Discarded</th>
<th>Valid</th>
<th>Response rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-Person</td>
<td>140</td>
<td>125</td>
<td>29</td>
<td>96</td>
<td>68.57</td>
</tr>
<tr>
<td>Online</td>
<td>60</td>
<td>55</td>
<td>11</td>
<td>44</td>
<td>73.33</td>
</tr>
</tbody>
</table>

Table 1. Sample size information

Source(s): Authors’ own creation/work
not a significant concern within the study. Furthermore, a full-collinearity test was executed, with all variance inflation factor (VIF) values remaining below the 3.3 thresholds (Table 3), except one, as suggested by Kock (2015). These results further strengthen the argument that the study was unaffected by any noteworthy CMB issues.

4.2 Respondents’ profile

Table 4 displays the demographic characteristics of the study participants, who were associated with 12 universities situated in major Pakistani cities: Karachi, Lahore, Islamabad, and Gujrat. Among 140 respondents, 70% were from public and 30% from private institutions. Predominantly, participants were from Punjab (78.6%), followed by Islamabad (10.0%), Khyber Pakhtunkhwa (5.7%), and Sindh (5.0%). Gender-wise, 67.9% were male and 32.1% were female. Notably, most held a master’s in science/philosophy (57.1%), followed by PhD (19.3%) and Masters (18.6%). Age distribution included 50.0% in the 26–35 bracket, 22.1% in 36–45, and 16.4% above 45 years.

4.3 Descriptive analysis

4.3.1 University-wise QECs’ effectiveness. The bar chart displaying university-wise QECs’ effectiveness reveals that 8 out of 12 universities had average scores ranging from 3.0 to 4.0 on

<table>
<thead>
<tr>
<th>Category</th>
<th>Group</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Levene's test for equality of variances</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS</td>
<td>In-person</td>
<td>96</td>
<td>3.6996</td>
<td>0.68881</td>
<td>0.181 0.637</td>
</tr>
<tr>
<td></td>
<td>Online</td>
<td>44</td>
<td>3.6104</td>
<td>0.68572</td>
<td>0.260 0.969</td>
</tr>
<tr>
<td>QI</td>
<td>In-person</td>
<td>96</td>
<td>3.5670</td>
<td>0.75748</td>
<td>0.637 0.637</td>
</tr>
<tr>
<td></td>
<td>Online</td>
<td>44</td>
<td>3.5617</td>
<td>0.68366</td>
<td>0.967 0.967</td>
</tr>
<tr>
<td>ST</td>
<td>In-person</td>
<td>96</td>
<td>3.4219</td>
<td>0.83059</td>
<td>0.260 0.969</td>
</tr>
<tr>
<td></td>
<td>Online</td>
<td>44</td>
<td>3.3977</td>
<td>0.99317</td>
<td>0.881 0.889</td>
</tr>
<tr>
<td>QECE</td>
<td>In-person</td>
<td>96</td>
<td>3.4583</td>
<td>0.96518</td>
<td>0.388 0.752</td>
</tr>
<tr>
<td></td>
<td>Online</td>
<td>44</td>
<td>3.5152</td>
<td>1.02540</td>
<td>0.757 0.757</td>
</tr>
</tbody>
</table>

Source(s): Authors’ own creation/work

Table 2.
Independent samples t-test results for non-response bias (n = 140)
the 5-point Likert scale. A significant portion (i.e., 75% of respondents) rated its effectiveness within this range, suggesting a “Barely Acceptable” level across most universities. Moreover, University E and University F stand out with the highest average scores of 4.5 and 4.4 respectively on the 5-point Likert scale. In these cases, 75% of respondents scored above 4.0, indicating a “Good” level of QECs’ effectiveness. In contrast, University I and University J received the lowest scores, averaging 2.9 and 3.0 respectively on the 5-point Likert scale. For University I, 75% of respondents rated below 3.0, and for University J, 50% rated below 3.5, both reflecting a “Poor” level of QECs’ effectiveness (See Figure 2).

4.3.2 Sector-wise QECs’ effectiveness. The sector-wise bar chart illustrates that QECs’ effectiveness received an average score of 3.7 for public-sector universities and 3.3 for private-sector universities. In public sector universities, 75% of respondents rated QECs’ effectiveness between 3.5 and 4.0, while for private sector universities, nearly all respondents rated it below 3.5, indicating a “Barely Acceptable” level in both sectors. However, QECs’ effectiveness is slightly more favorable in public sector universities compared to private sector ones (See Figure 3).

4.3.3 Gender-wise QECs’ effectiveness. The gender-wise bar chart displays an average QECs’ effectiveness score of 3.7 for male faculty members and 3.4 for female faculty members. In terms of males, 75% of respondents rated QECs’ effectiveness between 3.5 and 4.0, while

<table>
<thead>
<tr>
<th>Category</th>
<th>Sub-category</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>University sector</td>
<td>Public</td>
<td>98</td>
<td>70.0</td>
</tr>
<tr>
<td></td>
<td>Private</td>
<td>42</td>
<td>30.0</td>
</tr>
<tr>
<td>Province</td>
<td>Punjab</td>
<td>110</td>
<td>78.6</td>
</tr>
<tr>
<td></td>
<td>Sindh</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td></td>
<td>KPK</td>
<td>8</td>
<td>5.7</td>
</tr>
<tr>
<td></td>
<td>Federal</td>
<td>14</td>
<td>10.0</td>
</tr>
<tr>
<td></td>
<td>Others</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
<td>95</td>
<td>67.9</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>45</td>
<td>32.1</td>
</tr>
<tr>
<td>Qualification</td>
<td>PhDs.</td>
<td>27</td>
<td>19.3</td>
</tr>
<tr>
<td></td>
<td>M. Phil.</td>
<td>80</td>
<td>57.1</td>
</tr>
<tr>
<td></td>
<td>Master’s</td>
<td>26</td>
<td>18.6</td>
</tr>
<tr>
<td></td>
<td>Graduate</td>
<td>7</td>
<td>5.0</td>
</tr>
<tr>
<td>Age</td>
<td>25 Years or Less</td>
<td>9</td>
<td>6.4</td>
</tr>
<tr>
<td></td>
<td>26–35 Years</td>
<td>77</td>
<td>55.0</td>
</tr>
<tr>
<td></td>
<td>36–45</td>
<td>31</td>
<td>22.1</td>
</tr>
<tr>
<td></td>
<td>45 Years Plus</td>
<td>23</td>
<td>16.4</td>
</tr>
</tbody>
</table>

Source(s): Authors’ own creation/work

Table 4. Respondents’ profile

Figure 2. University-wise QECs’ effectiveness

Source(s): Author’s own creation/work
for females, nearly all respondents rated it below 3.5, suggesting a “Barely Acceptable” level for both genders. However, male respondents indicated slightly better perceptions of QECs’ effectiveness compared to female respondents (See Figure 4).

4.3.4 Overall QECs’ effectiveness (faculty satisfaction index—FSI). The Faculty Satisfaction Index (FSI) for QECs’ effectiveness was recorded as 3.6 on the 5-point Likert Scale, as shown in the left-hand side bar chart. This indicates that faculty members consider QECs’ effectiveness in HEIs to be “Barely Acceptable.” The accompanying box plot further supports this perception, with 75% of respondents sharing the view that QECs’ effectiveness is “Barely Acceptable” within their own universities (See Figure 5).

Source(s): Author’s own creation/work
4.4 Partial least squares structural equational modeling (PLS-SEM) analysis

In the second stage, hypotheses were tested using partial least squares structural equation modeling (PLS-SEM) through Smart PLS 4 software. PLS-SEM is chosen for its advantages, including its suitability for smaller sample sizes, non-normal data, and prediction-oriented models (Hair et al., 2019).

4.4.1 Measurement model. During the measurement model assessment (See Figure 6), all latent variable items were scrutinized for their factor loadings, with most exceeding 0.600. Exceptions were MS1, QI6, and QI7, which scored below 0.500 (Hair et al., 2016), resulting in their removal. To ensure the internal consistency reliability, the “composite reliability” (CR) was utilized to verify the reliability of study items (McNeish, 2018). Both Alpha and CR values surpassed 0.700 (Wasko and Faraj, 2005). Similarly, the “Average Variance Extracted” (AVE) values for all constructs were above 0.500 (Hair et al., 2014, 2016). The validation of the measurement model was affirmed through favorable outcomes in the recommended tests (Table 5) by researchers (Hair et al., 2014, 2017).

Furthermore, discriminant validity was evaluated using the “Heterotrait-Monotrait Ratio” (HTMT), a measure indicating the empirical distinctness of a construct from others (Hair et al., 2017). All variables’ HTMT ratios (Table 6) remained below the upper limit of 0.90 (Gold et al., 2001; Teo et al., 2008), affirming their acceptability.

4.4.2 Structural model. The structural model (See Figure 7) was used to test the hypotheses among study variables. All hypotheses (H1 to H3) were centered on direct relationships between variables. Firstly, H1 examined the significant and positive connection between management support and QECs’ effectiveness, with results confirming this ($\beta = 0.350$, $t = 3.761$, $p = 0.000$). Secondly, H2 explored whether quality infrastructure significantly

**Figure 6.** Measurement model assessment

*Source(s):* Author’s own creation/work
influenced QECs' effectiveness, with results confirming significance ($\beta = 0.308$, $t = 2.941$, $p = 0.003$). Thirdly, $H_3$ investigated the direct relationship between staff training and QECs' effectiveness, and the results confirmed its significance ($\beta = 0.228$, $t = 2.559$, $p = 0.011$).

Overall, all proposed hypotheses ($H_1$, $H_2$, and $H_3$) were supported. The outcomes for these three hypotheses concerning direct relationships are succinctly presented in Table 7.

Additionally, the model's explanatory power is assessed using the coefficient of determination ($R^2$) and effect size ($f^2$). The findings reveal an $R^2$ value of 0.634 for QECs, closely aligning with substantial effects (0.67), as per prior research thresholds indicating substantial (0.67), moderate (0.33), and weak (0.19) effects (Chin, 1998). The effect size ($f^2$) outcomes indicate a moderate impact of management support, quality infrastructure, and staff training on QECs' effectiveness (0.146, 0.092, and 0.063, respectively), consistent with suggested thresholds: substantial (0.35), moderate (0.15), and weak (0.02) (Cohen, 1988). The results of the values of $R^2$ and $f^2$ are given in Table 8.

5. Discussion, implications and limitations

5.1 Discussion on results

This study aimed to address two research questions. The first question evaluated faculty members' satisfaction regarding QECs in public and private universities in Pakistan.

<table>
<thead>
<tr>
<th>Constructs</th>
<th>Item</th>
<th>Loading</th>
<th>Alpha</th>
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<th>CR</th>
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<tr>
<td>Management support (MS)</td>
<td>MS2</td>
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</table>

Table 5. Factor loadings, reliability and convergent validity

Table 6. Discriminant validity – (HTMT)

Note(s): Abbreviations: AVE, average variance extracted; CR, composite reliability
Source(s): Authors' own creation/work

5. Discussion, implications and limitations

5.1 Discussion on results

This study aimed to address two research questions. The first question evaluated faculty members' satisfaction regarding QECs in public and private universities in Pakistan. The
analysis involved a descriptive examination of data using MS Excel and SPSS-25. Results indicated an average satisfaction rating of 3.6 out of 5 among faculty, implying moderate satisfaction with QEC effectiveness. This implies that while QECs are present in universities, their impact is somewhat limited. Issues like inactive QECs, lack of qualified QA staff, inadequate infrastructure, ineffectual institutional policies, and flawed procedures lead to systemic shortcomings hindering improvement efforts. These findings align with prior...
research showing that the presence of QECs in universities hasn’t led to significant academic improvements. Constraints like limited resources, resistance to change, leadership disengagement, inadequate training, low faculty motivation, and communication gaps with departments contribute to this situation. This also leads to lower international rankings (Iqbal et al., 2023a, c; Noreen and Mahmood, 2021; Shabbir et al., 2014, 2016). Public universities exhibit slightly better QEC effectiveness than private ones, possibly due to varying commitment to self-assessment. Notably, QEC effectiveness varies across institutions, with two rated “Good,” two “Poor,” and the rest “Barely Acceptable.” This divergence likely stems from differing leadership priorities, where some emphasize quality enhancement while others prioritize financial gains, potentially overlooking academic progress.

The second research question aimed to investigate the link between management support, quality infrastructure, staff training, and the effectiveness of QECs in Pakistani universities. To address this question, three hypotheses were formulated. The study leverages the RBV theory to offer insights into these connections. According to RBV theory, a firm’s competitive edge is determined by its capabilities and resources, which in turn influence its performance (Barney, 1991; Wernerfelt, 1984). However, resources need to be valuable, rare, hard to replicate, and irreplaceable for sustained competitive advantage (Barney, 1991). The study’s findings affirm the relevance of RBV theory in the realm of HE, highlighting the role of management support, quality infrastructure, and staff training as valuable university resources that enhance QEC effectiveness, leading to improved academic quality and heightened competitive advantage.

The outcomes of the first hypothesis (H1) demonstrate a positive and noteworthy association between management support and QECs’ effectiveness within the HE context, aligning with prior studies (Ali et al., 2015; Anwar, 2020; Dukhan et al., 2017; Iqbal et al., 2023b; Wijaya et al., 2019). Similarly, the results of the second hypothesis (H2) indicate a significant impact of quality infrastructure on QECs’ effectiveness in universities. These findings are in line with prior investigations that examined the role of infrastructure and learning resources in achieving quality assurance and accreditation (Alsoud et al., 2021; Patyal and Kollakumta, 2017; Ruso et al., 2015; Tamrat and Teferra, 2020). Likewise, the findings of the third hypothesis (H3) affirm the substantial and positive influence of staff training on QECs’ effectiveness, supported by several preceding studies (Al-Mzary et al., 2015; Ali and Hussain, 2014; Daniel, 2018; Nebo et al., 2015; Omosa et al., 2018; Rahman et al., 2013; Smith, 2010).

5.2 Implications
5.2.1 Theoretical implications. In this study, the RBV theory was employed to elucidate the conceptual model. RBV theory underscores the utilization of valuable internal resources to attain enduring performance and competitive advantage. The study developed a conceptual model to assess management support, quality infrastructure, and staff training as predictors of QECs’ effectiveness in both public and private universities. This research enhances our theoretical understanding of quality assurance practices by demonstrating the predictive influence of management support, quality infrastructure, and staff training as valuable RBV resources on QECs’ effectiveness within the higher education context. While prior studies have examined management support, quality infrastructure, and staff training as predictors, their emphasis has mainly revolved around dependent variables such as organizational and quality performance. Nonetheless, there has been a scarcity of investigations exploring the association between management support, quality infrastructure, and staff training and QECs’ effectiveness. Consequently, this study could potentially be pioneering in introducing QECs’ effectiveness as a criterion variable in the realm of higher education.
5.2.2 Practical implications. This study provides valuable insights for policymakers, university leaders, QEC managers, and faculty members engaged in quality assurance initiatives at their respective institutions. It underscores the significance of recognizing the value of management support, quality infrastructure, and staff training to enhance QEC effectiveness in both public and private universities. Furthermore, this research presents empirical evidence demonstrating the significant influence of management support, quality infrastructure, and staff training on QECs' effectiveness in higher education. This emphasizes the need for administrators and quality managers to prioritize strengthening QEC teams by offering appropriate facilities, environments, and resources. The critical role of top management is also highlighted, as without their support, quality assurance activities might not yield optimal results. Consequently, university leaders should provide training to academic and administrative staff engaged in quality assurance activities, such as self-assessment and program/institution accreditation, in order to enhance academic quality across their respective institutions.

5.3 Limitations and future research
The study is subject to certain limitations. Firstly, it utilizes a convenience sampling method and adopts a cross-sectional survey strategy. Secondly, the study’s coverage is restricted to 12 universities, with a predominant representation of 8 from Punjab, leaving only 4 from other regions of Pakistan. Additionally, the survey exclusively reflects the perspectives of faculty members. Considering these constraints, future researchers could enhance the generalizability of the results by using larger sample sizes, adopting probability sampling techniques, and involving various stakeholders such as quality managers and students.

6. Conclusion
QECs play a crucial role in both public and private universities, overseeing self-assessment (IQA) and accreditation (EQA) processes for academic programs and institutions. They are primarily responsible for aligning curricula with current and future needs, maintaining and elevating quality standards, nurturing excellence, and identifying deficiencies through self-assessment. Given their significant responsibilities, transparent communication with Vice Chancellors/Rectors, administrators, faculty members, as well as with Quality Assurance Agency and HEC, is vital. This fosters the resolution of quality issues, seeking guidance, and gaining support to promote continuous improvement.

To conclude, QECs’ effectiveness is notably deficient in the majority of Pakistani universities, demanding swift action from both public and private university leaders. The study underscores the value of managerial support, quality infrastructure, and staff training in bolstering QEC effectiveness at universities. Creating a positive change and nurturing a culture of quality across departments hinges on a strong collaboration between university leadership and QEC. Additionally, university leaders must ensure the provision of essential resources and infrastructure to support ongoing quality enhancement initiatives. This commitment also involves adequately training academic and administrative staff. By taking these proactive steps, universities can significantly improve the quality of their academic programs and overall performance, leading to significant gains in international rankings.

References


Appendix

Measurement scales

The items used in the present study instrument were adapted from previous literature, including Ahmed and Mohamed (2017), Batool and Qureshi (2007), Drogalas et al. (2015), Knight (2010), Kaur and Bhalla (2018), Lee et al. (2016), Musa and Baharum (2012), Rama and Nagurvali (2012), Raouf (2006), Samadi et al. (2018), Wu (2015), and Zwikael (2008).

Management support (MS)

For the following statements please indicate the option that matches your view most closely.

(1 – Strongly disagree; 3 – Neutral; 5 – Strongly agree)

1. QEC management and communicates the self-assessment schedule to departments in advance.
2. Department management facilitates program teams (PTs) to complete the SAR cycle of each program on time.
3. QEC management reviews the SARs within the defined time frame.
4. Department management takes corrective actions according to the implementation plan.
5. Management at all levels is committed to improving the quality of academic programs.
6. Management at all levels appreciates initiatives to improve the SAR process.
7. Management at all levels provides resources for successful conduction of SAR activities.
Quality infrastructure (QI)

For the following statements please indicate the option that matches your view most closely.
(1 – Strongly disagree; 3 – Neutral; 5 – Strongly agree)

1. QEC has an infrastructure (as defined by HEC) to implement the SAR process.
2. QEC has permanent staff to carry out the SAR process.
3. QEC has the authority to implement the SAR process.
4. Department formulates program team (PT) for each program.
5. Department follows a defined process to nominate faculty members for self-assessment.
6. The size of the program teams (PTs) is appropriate to complete the SAR process on time.
7. The size of the assessment teams (ATs) is appropriate to complete the SAR process on time.

Staff training (ST)

For the following statements please indicate the option that matches your view most closely (1 – Strongly disagree; 3 – Neutral; 5 – Strongly agree).

1. QEC conducts awareness sessions on a regular basis for all faculty members.
2. QEC training helps PT and AT members understand the SAR process.
3. Participation of team members (e.g. PT and AT) in SAR training is satisfactory.
4. Faculty members (other than PT and AT members) also participate in SAR training.

QEC effectiveness (QECE)

For the following statements please indicate the option that matches your view most closely (1 – Very poor; 3 – Barely acceptable; 5 – Very good).

1. QEC conducts the self-assessment of academic programs efficiently and effectively at our university.
2. QEC participates in the decision-making process to improve academic quality at our university.
3. QEC has improved the confidence and satisfaction of university stakeholders (e.g. students, parents, employers, etc.)

Source(s): Authors’ own work

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