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Beyond ISO 9001 Certification: Institutional Capacity for Sustaining Quality Management System Conformity in Kenyan Universities

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Abstract

This study examined institutional capacity for sustaining ISO 9001 Quality Management System (QMS) conformity in face-to-face university instruction in Kenya. An explanatory sequential mixed-methods design was employed in six ISO 9001-certified universities in the Rift Valley Region. Quantitative data were collected from 179 lecturers selected through proportionate stratified and simple random sampling, while 50 key informants were selected through census sampling. Questionnaires, interviews, and documentary review were used for data collection. Quantitative data were analysed using SPSS, while NVivo facilitated thematic analysis of qualitative evidence. Human resource management showed a strong positive relationship with QMS conformity ($r = .867$, $p = .001$), explaining 75.2 per cent of the variance. Financial management was also strongly associated with conformity ($r = .838$, $p = .001$), explaining 70.2 per cent of the variance, while time management explained 72.9 per cent. The overall regression model showed a strong relationship ($R = .854$), accounting for 72.9 per cent of the variance in QMS conformity (adjusted $R^2 = .726$). Qualitative and documentary evidence explained these relationships through five themes: competent QMS personnel and institutional expertise; systematic monitoring and internal auditing; institutional resources and financial support; corrective action and non-conformity management; and continuous improvement and sustainability. The study concludes that sustained ISO 9001 conformity depends on embedding quality practices in routine academic processes beyond certification. Universities should strengthen staff competence, resource provision, workload and time allocation, monitoring, corrective action, and continuous improvement mechanisms.

Key words: Higher education, institutional capacity, ISO 9001, QMS conformity, quality assurance.



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INTRODUCTION

Quality assurance in higher education increasingly requires institutions to establish processes through which academic activities are planned, implemented, monitored, evaluated, and improved. Quality management systems provide an organisational structure for coordinating these activities through defined responsibilities, processes, controls, performance evaluation mechanisms, and improvement arrangements. ISO 9001:2015 sets requirements for establishing, implementing, maintaining, and continually improving a quality management system and adopts a process-oriented approach to quality management (International Organization for Standardization [ISO], 2015). This orientation is relevant to universities because teaching, assessment, student supervision, academic monitoring, and related support processes involve interconnected activities that require systematic planning, implementation, evaluation, and improvement.

ISO 9001 certification, however, should not be equated with permanent or unconditional conformity. ISO/IEC 17021-1:2015 defines management-system certification as a third-party conformity-assessment activity conducted by competent and impartial certification bodies (International Organization for Standardization & International Electrotechnical Commission [ISO/IEC], 2015). Certification therefore provides evidence that a management system has been assessed against specified requirements within a defined scope and assessment context. It does not, by itself, establish that every QMS procedure will continue to be implemented consistently in routine institutional practice. This distinction is particularly important in higher education, where formal quality arrangements must be translated into everyday teaching, assessment, supervision, monitoring, documentation, and improvement activities.

The sustainability of quality management therefore depends on whether formal quality arrangements become institutionalised within routine practice. Quality culture literature indicates that structural quality arrangements need to interact with managerial, organisational, and human dimensions if quality is to become embedded. Verschueren et al. (2023), for example, conceptualised quality culture in higher education through the interaction of structural and managerial elements with human and interpersonal dynamics. Hsu (2023) similarly found that internal quality-assurance mechanisms can contribute to institutional change and the development of quality culture. These perspectives suggest that quality

sustainability is not simply a consequence of having documented procedures but depends on the institutional conditions under which those procedures are enacted.

The Kenyan higher education context provides an important setting for examining this issue. The Commission for University Education (CUE) is mandated to assure the quality of university education, training, and research in Kenya. Its Strategic Plan 2024/25–2028/29 places quality, relevance, and sustainability within its strategic direction and identifies monitoring compliance and assuring quality university education among its institutional priorities (Commission for University Education [CUE], 2024). Kenyan universities therefore operate within a quality-assurance environment involving institutional quality-management systems, internal monitoring, external assessment, and regulatory expectations.

ISO 9001-related practices have also been associated with academic and service outcomes in Kenyan universities. Wangai et al. (2021) reported that ISO 9001 standards significantly influenced the quality of academic programmes at the University of Nairobi. Muchai et al. (2022) found a positive significant relationship between continual improvement under ISO 9001:2015 and post-examination service delivery in Kenyan public universities. Although these studies demonstrate the relevance of ISO-based quality-management practices to university processes, they provide less direct evidence concerning the institutional capacities through which conformity to QMS procedures is sustained across recurring instructional activities.

The present study consequently shifts the analytical focus from certification status to the institutional capacity required to sustain QMS conformity. Institutional capacity is conceptualised as the organisational ability to provide competent personnel, resources, time, monitoring arrangements, corrective-action mechanisms, and improvement processes required for the continued implementation of QMS procedures. Human resource management, financial management, and time management represent three selected dimensions of this capacity. Human resource management concerns the competence, availability, training, responsibilities, and expertise of personnel involved in QMS processes. Financial management concerns the availability and timely allocation of resources required to implement quality activities. Time management concerns the institutional ability to incorporate quality-related

activities into schedules and workloads so that planning, implementation, monitoring, auditing, corrective action, and review can be undertaken consistently.

The study therefore addresses a problem that extends beyond whether universities possess ISO 9001 certification. The central issue is whether certified universities have the organisational capacity to maintain the QMS requirements embedded in routine academic processes. This distinction is particularly relevant to face-to-face instruction, where teaching, assessment, student supervision, academic monitoring, and related activities occur repeatedly and require continuous coordination. Against this background, the study examined the relationships between human resource management, financial management, time management, and conformity to ISO 9001 QMS procedures and used qualitative and documentary evidence to explain the institutional practices associated with these relationships. The study thus positions sustained conformity as an ongoing organisational process rather than a completed certification outcome.

The purpose of this study was to examine the institutional capacity and management practices associated with sustaining conformity to ISO 9001 QMS procedures in face-to-face university instruction in chartered universities in Kenya's Rift Valley Region. Specifically, the study examined the relationships between human resource management, financial management, time management, and QMS conformity and qualitatively explored the institutional practices, resources, and management mechanisms through which conformity is sustained beyond certification. The study addressed the following research questions: What is the relationship between human resource management, financial management, time management, and conformity to ISO 9001 QMS procedures in face-to-face university instruction? What institutional practices, resources, and management mechanisms enable or constrain sustained conformity to ISO 9001 QMS procedures beyond certification?

LITERATURE REVIEW

ISO 9001 specifies the requirements for establishing and maintaining a quality management system, covering areas such as process management, performance assessment, resource allocation, corrective measures, and continuous improvement (ISO, 2015). Its application in higher education has attracted both support and criticism. Jingura et al. (2019) found a theoretical and empirical

basis for applying ISO 9001 in higher education, particularly in relation to quality assurance, quality enhancement, and quality culture. At the same time, they recognised that implementation can generate additional workload and institutional demands. This suggests that the value of ISO 9001 in universities cannot be assessed solely by whether its requirements are formally adopted. The organisational conditions under which those requirements are implemented are also important.

Ab Wahid (2019) provides particularly relevant evidence concerning post-certification sustainability. Examining an ISO 9001-based QMS in a public university over two decades, the study identified initiation, internalisation, alignment, and improvement as stages in the institution's quality journey. Commitment, training, and communication supported sustainability, whereas inadequate knowledge and skills, limited commitment, inadequate resources, and communication problems constrained it. The longitudinal nature of this evidence is important because it demonstrates that sustaining a QMS involves institutional development beyond the initial certification process. However, the study focused on one university and did not quantitatively examine how distinct management capacities relate to sustained conformity in routine instructional processes.

International evidence also indicates that the effects of QMS implementation are not necessarily uniform across educational organisations. Rodríguez-Mantilla et al. (2024), examining 83 educational centres in Spain, identified three organisational profiles associated with different levels of impact following implementation of a quality management system. Differences were also associated with factors including duration of implementation and internal financial support. These findings challenge an assumption that certification or implementation produces homogeneous organisational outcomes. Instead, the institutional conditions surrounding implementation appear to shape the extent to which quality-management arrangements become embedded and produce organisational effects. The literature therefore points to an important distinction between formal implementation and sustained institutionalisation.

Formal implementation concerns the establishment and operation of documented QMS requirements, whereas institutionalisation concerns the extent to which those requirements become integrated into ordinary organisational behaviour and decision-making. Sustained

conformity in the present study is situated within this distinction and refers to the continued and demonstrable fulfilment of established QMS requirements through consistent implementation, monitoring, corrective action, and continual improvement. Quality culture provides an additional perspective for understanding why certification does not necessarily guarantee sustained conformity. Verschueren et al. (2023) conceptualised quality culture as involving structural and managerial dimensions together with human and interpersonal dynamics. Their maturity-oriented model suggests that quality systems become stronger when formal structures are connected to communication, leadership, information, participation, and institutional practices. The implication is that quality cannot be sustained solely through procedures that exist independently of the people and organisational processes responsible for implementing them.

Hsu (2023) similarly examined changes in quality-assurance mechanisms and quality culture in Taiwanese higher education. The findings suggest that internal quality-assurance arrangements can contribute to institutional change when quality processes become part of the organisation's broader practices. This evidence is relevant to the present study because it reinforces the proposition that formal quality systems require organisational embedding. Pushpakumara et al. (2023), in a systematic review of quality assurance in higher education, identified institution-related, process-related, and stakeholder-related challenges. The review highlighted the importance of awareness, process improvement, policy development, stakeholder engagement, and information systems. Of particular relevance is the observation that quality assurance may become detached from everyday institutional activities. This suggests that the sustainability of QMS conformity requires integration with routine organisational processes rather than treating quality assurance as a parallel administrative function.

The quality-culture literature therefore complements the ISO 9001 literature by explaining the organisational dimension of sustainability. Whereas ISO 9001 specifies requirements for a quality management system, quality-culture research draws attention to the conditions through which quality practices become embedded in organisational behaviour. The present study connects these perspectives by examining the management capacities that enable QMS requirements to remain operational in routine academic practice. Human

resource capacity is central to the implementation of quality-management systems because procedures require people who possess the competence to interpret, implement, monitor, document, and improve them. Ab Wahid (2019) identified training, commitment, communication, knowledge, and skills as important to QMS sustainability. This evidence suggests that personnel capability is not merely an administrative input but a continuing institutional condition for quality-management performance. Financial capacity represents another dimension of institutional support. ISO 9001 requires organisations to determine and provide resources necessary for establishing, implementing, maintaining, and continually improving the QMS (ISO, 2015).

Rodríguez-Mantilla et al. (2024) also identified internal financial support among the factors associated with differences in organisational impact following QMS implementation. However, the literature provides less evidence concerning how financial management operates specifically within university instructional processes. The issue is therefore not only the amount of resources available but also their accessibility and timing. Time represents a further institutional constraint. Quality activities such as planning, internal auditing, monitoring, review, corrective action, and follow-up require time to be deliberately allocated within institutional schedules. Where academic workloads and competing responsibilities leave insufficient time for these activities, QMS implementation may become episodic and concentrated around external assessment periods. The literature on quality assurance identifies institutional and process constraints, but comparatively less empirical attention has been directed toward time management as a distinct institutional capacity associated with sustained QMS conformity in university instruction.

The three capacities are potentially complementary. Competent personnel are required to operate QMS processes, financial resources enable those processes to be undertaken, and time allocation provides the conditions for their completion. Examining these factors together therefore provides a more comprehensive account of institutional capacity than considering any single management function in isolation. Kenyan evidence confirms that ISO-related quality-management practices are relevant to university academic processes. Wangai et al. (2021) demonstrated that the implementation of ISO 9001 standards significantly influenced the quality of academic programmes at the University of Nairobi. Similarly, Muchai et al. (2022)

established a significant positive association between continual improvement practices and the delivery of post-examination services in Kenyan public universities. These studies demonstrate the relevance of QMS principles but focus primarily on academic programme quality and service-delivery outcomes.

The literature nevertheless leaves several gaps. First, relatively limited empirical attention has been given to the institutional capacities that sustain conformity after certification. Second, human resource management, financial management, and time management have rarely been examined together as complementary dimensions of institutional capacity in relation to QMS conformity. Third, existing evidence provides limited integration of statistical relationships with qualitative and documentary evidence showing how management capacities are enacted in routine university practice. Finally, there is limited evidence focused specifically on face-to-face instructional processes in Kenyan universities.

The present study addresses these gaps by examining the relationships between human resource management, financial management, time management, and QMS conformity and by using interviews, open-ended responses, and institutional documents to explain the institutional practices associated with those relationships. The study therefore contributes a mixed-methods perspective that connects measurable management capacities with the organisational processes through which sustained conformity is enacted.

Theoretical Framework

This study was guided by Deming's management philosophy of quality, which positions quality improvement as a management responsibility and emphasises systematic improvement of organisational processes (Deming, 1986). The perspective is appropriate because sustained QMS conformity requires management to create organisational conditions in which people and processes can consistently perform according to established requirements. Quality is therefore viewed not as the product of isolated inspection or certification activities but as an outcome of the way an organisation designs, manages, evaluates, and continuously improves its processes.

The Plan-Do-Check-Act (PDCA) logic incorporated in ISO 9001 provides an operational representation of this continuous process orientation (ISO, 2015). In the present study, however, PDCA is not treated as the

theoretical framework by itself. Rather, it provides the process mechanism through which institutional capacity is expected to be translated into sustained conformity. Planning requires competent personnel, appropriate resources, and adequate time. Implementation depends on personnel capability and resource availability. Checking requires systematic monitoring, measurement, internal auditing, and review. Action requires corrective responses, follow-up, and institutional learning.

Within this framework, human resource management, financial management, and time management are conceptualised as interconnected institutional capacities that can facilitate or constrain QMS processes. Human resource management represents the capacity to provide competent personnel, define responsibilities, support training, and maintain the expertise required to implement QMS procedures. In this context, personnel competence supports interpretation of requirements, implementation of procedures, audit participation, documentation, non-conformity management, and improvement activities.

Financial management represents the institutional capacity to determine, provide, control, and make accessible the resources required for QMS activities. ISO 9001 requires organisations to provide the resources necessary to establish, implement, maintain, and continually improve the QMS (ISO, 2015). Within universities, such resources may support staff development, internal auditing, documentation, information systems, monitoring, corrective action, and improvement initiatives. Financial management is consequently conceptualised as an enabling institutional condition rather than a direct measure of conformity.

Time management represents the capacity to allocate and protect sufficient institutional time for quality-related activities. QMS processes require time for planning, teaching, assessment, monitoring, auditing, management review, corrective action, and follow-up. Where these activities compete with other institutional responsibilities, implementation may become irregular. Time management is therefore conceptualised as the institutional capacity to incorporate QMS requirements into academic schedules, workloads, and operational planning.

The theoretical relationship can be represented as follows:

Human resource capacity + financial capacity + time capacity → QMS process capability → sustained QMS conformity

The three capacities are complementary rather than independent in practice. Competent personnel may be unable to implement procedures consistently where resources are unavailable or where insufficient time is allocated. Similarly, financial resources may not produce effective quality-management processes where personnel lack the required competence or quality responsibilities are not integrated into institutional schedules. The framework therefore proposes that sustained conformity depends on the interaction between organisational capacity and the quality-management processes through which formal requirements are enacted.

Sustained QMS conformity is the dependent construct. It refers to the continued and demonstrable fulfilment of established QMS requirements through routine implementation, monitoring, evaluation, corrective action, and continual improvement. This differs from certification status, which represents the outcome of a specified conformity-assessment process. ISO/IEC 17021-1:2015 identifies management-system certification as third-party conformity assessment undertaken by competent and impartial certification bodies (ISO/IEC, 2015). The present study instead examines the institutional conditions associated with maintaining conformity in routine instructional practice.

The framework also informed the mixed-methods integration. Quantitative analysis examined the magnitude and direction of relationships between selected management capacities and QMS conformity. Qualitative and documentary evidence examined the organisational practices through which those capacities were manifested, including staff competence, monitoring, auditing, resource provision, corrective action, and continual improvement. The framework therefore provides a basis for interpreting statistical associations alongside contextual evidence without assuming deterministic causation.

METHODOLOGY

The study employed an explanatory sequential mixed-methods design. The quantitative phase examined relationships between human resource management, financial management, time management, and conformity to ISO 9001 QMS procedures. The subsequent qualitative phase used semi-structured

interviews, open-ended questionnaire responses, and institutional documents to explain and contextualise the quantitative findings. Integration occurred during interpretation, with qualitative and documentary evidence used to examine how institutional capacities were manifested in routine quality-management practices. The study was conducted in six chartered ISO 9001-certified universities in Kenya's Rift Valley Region. The participating institutions comprised five public and one private university. The study focused on face-to-face university instruction and sustained conformity to established QMS procedures within routine academic processes.

The study population comprised 388 participants, including six Quality Assurance Officers, six ISO Coordinators, six Finance Managers, six Deans, 26 Academic Department Heads, and 338 lecturers from the Schools of Education of the participating universities. The 50 institutional key informants were selected through census sampling because their population was small and manageable. Lecturers were selected using proportionate stratified sampling to determine institutional representation, followed by simple random sampling within the respective strata. The target sample comprised 229 participants, including 50 institutional key informants and 179 lecturers. The questionnaire response rate was approximately 83 per cent.

Quantitative information was obtained through a structured questionnaire comprising Likert-scale items designed to assess human resource management, financial management, time management, and adherence to ISO 9001 QMS procedures. For the qualitative component, data were generated from semi-structured interviews and responses to open-ended questionnaire items. Documentary analysis provided additional evidence from accessible institutional records, including ISO audit reports, non-conformity and corrective-action records, quality manuals, standard operating procedures, staff training records, teaching timetables, workload records, course evaluations, and quality-assurance reports covering the study period. The use of questionnaires, interviews, and documentary evidence supported triangulation by enabling reported practices to be considered alongside institutional records.

Content validity was established through review of relevant literature, alignment of questionnaire items with the study variables and theoretical framework, and expert assessment by the research supervisors. The instruments

were pilot-tested in two ISO 9001-certified universities in Kenya's Central Region that were excluded from the main study. Internal consistency was assessed using Cronbach's alpha. The 84-item questionnaire yielded an alpha coefficient of .915, indicating high internal consistency. The credibility of the qualitative results was strengthened through systematic coding, triangulation of evidence from interviews, open-ended questionnaire responses, and documentary sources, and inter-coder procedures in theme development.

Quantitative analysis was conducted using SPSS version 30. Descriptive statistics were first used to summarise the study variables. Pearson's product-moment correlation assessed the magnitude and direction of linear associations between the management factors and QMS conformity. Regression analysis subsequently examined the extent to which these management factors accounted for differences in conformity. Individual-factor R^2 estimates were derived from separate regression models, whereas a multiple linear regression model was fitted to assess the combined explanatory contribution of human resource management, financial management, and time management.

The assumptions underlying regression analysis were examined, including normality, linearity, homoscedasticity, independence of observations, and multicollinearity. Model performance was assessed using R , R^2 , adjusted R^2 , the F-statistic, and associated significance levels. We assessed the contribution of individual predictors using regression coefficients and corresponding inferential statistics. Statistical tests were interpreted at the .05 significance level.

Qualitative data were analysed thematically using NVivo. The coding process concentrated on staff competence and training, QMS implementation, resource provision, planning, monitoring and auditing, corrective action, and continual improvement. Themes were generated iteratively by considering both the theoretical framework underpinning the study and recurring patterns identified in the data. Integration of the quantitative, qualitative, and documentary evidence took place during interpretation, with the different sources being compared to establish areas of convergence and complementarity, as well as findings requiring further qualification.

The Kabarak University Research Ethics Committee (KUREC) approved the study. The National Commission for Science, Technology and Innovation (NACOSTI)

granted research authorisation, and participating universities granted institutional permission. Participants provided informed consent and participation was voluntary. Confidentiality and anonymity were maintained, and findings were reported in aggregate form to minimise identification of individual participants and institutions.

RESULTS AND DISCUSSION

The findings demonstrate that sustained conformity to ISO 9001 QMS procedures is associated with institutional capacity to provide competent personnel, resources, time, monitoring, corrective action, and continual improvement. The quantitative findings established strong statistical relationships between the selected management factors and QMS conformity, while the qualitative and documentary evidence provided contextual insight into how institutional capacity was manifested in practice. The qualitative analysis produced five interrelated themes: competent QMS personnel and institutional expertise; systematic monitoring and internal auditing; institutional resources and financial support; corrective action and non-conformity management; and continuous improvement and sustainability. The themes should not be interpreted as five additional statistically tested variables. Rather, they represent institutional practices and processes through which the management capacities examined quantitatively were enacted.

Competent QMS Personnel and Institutional Expertise

The first theme concerned personnel competence and institutional expertise. Interviews indicated that Quality Assurance Officers, ISO Coordinators, academic managers, and other staff with relevant knowledge played important roles in interpreting QMS requirements, supporting implementation, coordinating audits, maintaining documentation, and following up on corrective actions. The evidence suggests that documented QMS requirements are not translated automatically into routine practice. Personnel require knowledge, training, experience, and institutional support to interpret requirements within specific university processes.

This evidence provides contextual interpretation of the quantitative finding for human resource management. Human resource management was strongly associated with QMS conformity ($r = .867$, $p = .001$), and the corresponding regression model accounted for 75.2 per cent of the variance in conformity. The result should be

interpreted as a statistical association within the study context rather than as proof of causal effect. The qualitative evidence nevertheless helps explain the organisational significance of the association by showing how personnel competence supports implementation, auditing, documentation, and corrective-action follow-up.

The finding is consistent with Ab Wahid (2019), who identified commitment, training, communication, and organisational knowledge as important to sustaining an ISO 9001-based QMS in higher education. This also complements Wangai et al. (2021), who reported a significant influence of ISO 9001 standards on academic programme quality in a Kenyan university. The present study extends this evidence by focusing specifically on the institutional capacity required to sustain conformity in recurring instructional processes. From Deming's perspective, this finding reinforces the responsibility of management to create conditions that enable personnel to perform effectively and participate in systematic improvement (Deming, 1986).

Systematic Monitoring and Internal Auditing

The second theme concerned systematic monitoring and internal auditing. Participants described master audit schedules, quality reviews, spot checks, readiness assessments, and corrective-action tracking as mechanisms for identifying deviations during routine operations. The evidence suggests that conformity is more likely to be sustained when monitoring occurs throughout the institutional cycle rather than being concentrated around external certification or surveillance assessments. The time-management regression model accounted for 72.9% of the variance in QMS conformity. This statistical result should not be interpreted as evidence that time management independently causes conformity. The qualitative evidence provides contextual insight into the relationship by indicating that scheduling and allocation of institutional time affect the ability to undertake monitoring, internal auditing, review, and corrective-action follow-up. Where quality activities are not incorporated into routine schedules, monitoring may become episodic.

The finding is consistent with the process orientation of ISO 9001 and complements Jingura et al. (2019), who identified ISO 9001 as adaptable to higher education and relevant to quality assurance and enhancement. It also complements Muchai et al. (2022), who found a positive significant relationship between continual improvement

and post-examination service delivery in Kenyan public universities. The present evidence extends these findings by emphasising that monitoring is most valuable when its results are incorporated into corrective action and subsequent improvement.

Institutional Resources and Financial Support

The third theme concerned institutional resources and financial support. Participants identified training resources, financial approvals and disbursements, digital systems, documentation, technological infrastructure, and operational support as conditions affecting QMS implementation. Resource constraints were associated with limitations in staff development, auditing, documentation, technology, and improvement activities. Financial management demonstrated a strong positive association with QMS conformity ($r = .838$, $p = .001$), with the corresponding regression model accounting for 70.2 per cent of the variance. The qualitative evidence provides insight into why financial management matters within the QMS process. Training requires funding, internal audits require operational support, corrective actions may require procurement or technological investment, and digital quality systems require continuing resources.

The finding is consistent with Ab Wahid (2019), who identified inadequate resources as a challenge to the sustainability of an ISO 9001-based QMS in higher education. It also accords with Rodríguez-Mantilla et al. (2024), who found differences in organisational impact associated partly with internal financial support. The present study extends this evidence by indicating that financial capacity involves not only resource availability but also accessibility and timing. Delayed approvals or disbursements may affect the implementation of activities that have already been planned.

Corrective Action and Non-Conformity Management

The fourth theme concerned corrective action and non-conformity management. The evidence indicates that identifying a weakness does not automatically improve conformity. The effectiveness of monitoring and auditing depends on whether identified deficiencies are investigated, addressed, followed up, and verified. The documentary evidence examined in the study included audit reports, non-conformity records, corrective-action records, quality-assurance reports, and related QMS documentation. These records provided evidence of conformity, areas requiring improvement, and non-conformities and were used alongside interview accounts

to examine institutional responses to identified gaps. Because the available study evidence does not provide aggregate frequencies of each audit category, the documentary findings are interpreted qualitatively rather than presented as prevalence estimates.

Corrective action can be understood as a process linking the three management capacities examined quantitatively. Competent personnel are required to interpret findings and determine appropriate responses; time is required to investigate and implement corrective measures; and financial resources may be required where corrective action involves training, procurement, infrastructure, or technological changes. This finding is consistent with the continual-improvement orientation of ISO 9001 and with Muchai et al. (2022), whose findings demonstrate the relevance of continual improvement to university service delivery. The present study further emphasises that corrective action should not end with recording an intervention. Follow-up and verification are necessary to determine whether the identified problem has been addressed and whether the response has reduced the likelihood of recurrence.

Continuous Improvement and Sustainability

The fifth theme concerned continual improvement and the sustainability of ISO-based quality management. Participants indicated that certification should not be treated as a one-time institutional achievement. Instead, continued conformity depends on whether quality practices become embedded in routine planning, implementation, monitoring, review, and improvement.

The qualitative evidence identified gap analysis, mock audits, corrective-action closure, pre-assessment activities, PDCA cycles, digital QMS platforms, policy review, and institutional reforms as practices supporting continual improvement. These practices indicate a shift from episodic preparation for external assessment towards institutional learning.

The finding is consistent with Ab Wahid (2019), whose longitudinal study identified internalisation, alignment, and improvement as stages in sustaining an ISO 9001-based QMS. It also complements Muchai et al. (2022), who found a significant relationship between continual improvement and post-examination service delivery. Verschueren et al. (2023) similarly emphasised the interaction between formal quality structures and human and organisational dimensions of quality culture. The present study extends this literature by positioning

continual improvement as the process through which the different dimensions of institutional capacity are connected. Personnel competence supports implementation and interpretation; resources support planned activities and interventions; time allocation permits monitoring and review; corrective action addresses identified deficiencies; and improvement processes incorporate lessons into subsequent practice.

Integration of Quantitative, Qualitative, and Documentary Findings

The explanatory sequential design produced substantial convergence between the quantitative and qualitative strands. The quantitative results established strong relationships between the selected management factors and QMS conformity, while qualitative and documentary evidence illustrated the institutional practices through which those capacities were operationalised. Human resource management produced the strongest individual regression result, with the corresponding model accounting for 75.2 per cent of the variance in conformity. Qualitative evidence showed that this capacity was manifested through competent Quality Assurance Officers, ISO Coordinators, trained staff, institutional expertise, audit coordination, documentation, and corrective-action follow-up.

Financial management accounted for 70.2% of the variance in its corresponding regression model. The qualitative evidence indicated that financial capacity was manifested through training resources, audit support, technological infrastructure, documentation systems, and the timely availability of approved resources. The time-management model accounted for 72.9 per cent of the variance. The qualitative evidence indicated that the allocation of institutional time affected the ability to undertake monitoring, internal auditing, quality reviews, and corrective-action follow-up. This provides contextual support for interpreting time as an institutional capacity that facilitates the integration of quality activities into routine academic work.

The overall multiple regression model produced $R = .854$, $R^2 = .729$, and adjusted $R^2 = .726$. The three management factors therefore jointly accounted for a substantial proportion of variation in QMS conformity within the study context. The individual R^2 values should not be added together because they were obtained from separate regression models, whereas the overall R^2 represents the combined multiple regression model.

Table 1: Integration of Quantitative, Qualitative, and Documentary Evidence on Institutional Capacity and Sustained QMS Conformity

Management capacity/model	Quantitative evidence	Qualitative and documentary evidence	Integrated interpretation
Human resource management	$r = .867, p = .001; R^2 = .752$	Competent QMS personnel, Quality Assurance Officers, ISO Coordinators, staff training, institutional expertise, audit coordination, documentation, corrective-action follow-up	Personnel competence provides the expertise required to translate formal QMS requirements into routine institutional practice.
Time management	$R^2 = .729$	Scheduling of audits and reviews, monitoring activities, quality reviews, spot checks, and time for corrective-action follow-up	Allocation of institutional time supports the incorporation of QMS activities into routine operations rather than episodic audit preparation.
Financial management	$r = .838, p = .001; R^2 = .702$	Training resources, audit support, documentation, technological infrastructure, and timely access to approved resources	Financial capacity provides enabling resources for planned quality activities, corrective action, and improvement.
Overall multiple regression model	$R = .854; R^2 = .729; \text{adjusted } R^2 = .726$	Personnel competence, monitoring, resource provision, corrective action, and continual improvement operate in an interconnected process	Sustained conformity is associated with integrated institutional capacity rather than certification status alone.

Note. R^2 values for the individual management capacities represent separate regression models and are not additive. The qualitative and documentary evidence provides contextual and explanatory interpretation and was not treated as additional statistically tested predictor variables.

The integration demonstrates convergence but also extends the quantitative findings. Convergence occurs because the qualitative evidence provides plausible institutional manifestations of the statistical relationships. Extension occurs because the qualitative and documentary evidence identifies process mechanisms that are not captured directly by the three quantitative predictors, particularly monitoring, corrective action, and continual improvement. The integrated findings can therefore be interpreted through Deming's quality-management philosophy and the PDCA logic of ISO 9001. Institutional capacity creates conditions for planning and implementation; monitoring and auditing generate evidence about performance and conformity; corrective action addresses identified deficiencies; and lessons from these processes inform subsequent planning and improvement. Sustained conformity is therefore better understood as the repeated operation of an institutional quality-management cycle than as the achievement of certification at a particular point in time.

CONCLUSION AND RECOMMENDATIONS

Conclusion: The study examined the institutional capacity and management practices associated with

sustaining conformity to ISO 9001 QMS procedures in face-to-face university instruction. The conclusion is organised around the two research questions.

Regarding Research Question 1, the findings demonstrate strong statistical associations between the selected dimensions of institutional management capacity and QMS conformity. Human resource management showed the strongest individual relationship, with $r = .867, p = .001$, and the corresponding regression model accounted for 75.2 per cent of the variance in conformity. This finding indicates the importance of personnel competence, training, institutional expertise, documentation, audit coordination, and corrective-action follow-up in the operation of QMS processes. Financial management also showed a strong positive association with conformity, with $r = .838, p = .001$, and the corresponding regression model accounting for 70.2 per cent of the variance. Financial capacity was manifested through resources for training, auditing, documentation, technological systems, monitoring, corrective action, and improvement activities. The findings further indicate that the accessibility and timely release of approved resources are important dimensions of financial capacity.

The time-management model accounted for 72.9 per cent of variance in QMS conformity. Qualitative evidence indicated that institutional scheduling and workload allocation affect the ability of staff to undertake monitoring, internal auditing, quality reviews, and corrective-action follow-up. Time management therefore represents an important institutional condition for integrating QMS activities into routine academic operations. The combined multiple regression model produced $R = .854$, $R^2 = .729$, and adjusted $R^2 = .726$. Interpret the results as statistical associations and explanatory relationships within the study context, not as evidence of deterministic causation.

Regarding Research Question 2, the qualitative and documentary findings identified five interrelated institutional practices that enable sustained conformity: competent QMS personnel and institutional expertise; systematic monitoring and internal auditing; adequate and accessible institutional resources; effective corrective-action and non-conformity management; and continual improvement. These practices demonstrate that management capacities operate through quality-management processes rather than functioning as isolated administrative inputs. Overall, the findings indicate that sustained QMS conformity is fundamentally an issue of institutional capacity. Certification establishes recognition that a management system has undergone conformity assessment, but continued conformity depends on whether the institution possesses the personnel, resources, time, monitoring systems, corrective-action mechanisms, and improvement practices necessary to keep QMS requirements operational. ISO 9001 certification should therefore be understood as an entry point into an ongoing quality-management process rather than as the endpoint of institutional quality assurance.

Recommendations: Universities should strengthen human resource capacity for sustained QMS conformity by providing regular and relevant training to personnel involved in quality management, teaching, assessment, and academic administration. QMS responsibilities should be clearly defined, and institutions should maintain sufficient competent personnel to support quality planning, implementation, monitoring, auditing, documentation, and corrective action. These measures directly respond to the strong relationship identified between human resource management and QMS conformity.

Universities should integrate quality-management requirements into routine financial planning and resource allocation. Institutional budgets should provide predictable and accessible resources for staff development, internal audits, monitoring, documentation, corrective action, technological systems, and other quality-related activities. The finding that financial management accounted for 70.2 per cent of variance in the corresponding regression model indicates the importance of treating quality-related expenditure as part of routine institutional planning rather than as an occasional requirement associated with external certification or surveillance.

Universities should institutionalise systematic monitoring and internal auditing of face-to-face academic processes. Teaching, assessment, student supervision, academic monitoring, documentation, and related activities should be monitored according to planned schedules, and audit findings should be communicated to responsible units and incorporated into management review and improvement processes. Institutional schedules and workloads should also provide sufficient time for these activities to be completed.

Universities should strengthen mechanisms for managing non-conformities and corrective actions. Identified deficiencies should be documented, assigned to responsible units or officers, addressed within defined timelines, and followed up to establish whether corrective action has been effectively implemented. Where necessary, institutions should assess whether implemented corrective actions address the root causes of identified problems and prevent their recurrence. This would strengthen the link between monitoring evidence and institutional improvement.

Universities should integrate QMS requirements into departmental and institutional planning rather than maintaining quality activities as parallel administrative processes. Quality objectives, monitoring indicators, audit findings, staff development, teaching schedules, assessment processes, and corrective-action activities should be incorporated into regular planning and performance-review processes. Such integration would support the transition from episodic audit preparation to routine quality management.

Finally, university management should strengthen a culture of continual improvement in which evidence from audits, monitoring, stakeholder feedback,

performance reviews, non-conformities, and corrective actions is systematically used to improve academic processes. The institutionalisation of such practices can strengthen the capacity of universities to maintain QMS	conformity across certification cycles and support the longer-term development of quality-management practices.
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