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Strategic Planning as a Cornerstone of Quality Assurance in Higher Education: A Coupling Model with ISO 21001, ESG/ASG-QA, and Evidence Dashboards

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Abstract: *This paper argues that strategic planning is the engine of quality assurance (QA) in higher education when it is explicitly coupled with recognized reference frameworks and operational evidence infrastructures. Drawing on an integrative synthesis of the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), the African Standards and Guidelines for Quality Assurance (ASG-QA), and ISO 21001:2018, we propose a "coupling model" that links mission and goals to process inventories, risk registers, and role-based dashboards. We illustrate the model with the Cameroonian policy context namely the Education and Training Sector Strategy 2023–2030 (ETSS 2030) and the National Development Strategy 2020–2030 (NDS30) and with regional QA reforms (e.g., South Africa's QAF). We show how institutional KPIs can be derived from sector targets and embedded in Plan-Do-Check-Act (PDCA) cycles supported by an EMIS 2.0 architecture focused on learning and accountability. Recent research on learning-analytics dashboards and human-centered provides design considerations for usability, equity, and pedagogical actionability. The contribution is a practical mapping procedure and dashboard specification that translate high-level QA requirements into auditable processes, data elements, and governance artifacts feasible for universities in resource-constrained settings.*

Keywords: quality assurance; ISO 21001; ESG; ASG-QA; EMIS 2.0; learning-analytics dashboards; Cameroon

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INTRODUCTION

Quality assurance (QA) in higher education understood here as the system of policies, processes and evidence used to plan, deliver, monitor and improve academic quality and standards has shifted decisively from episodic, compliance-oriented audits to a continuous, data-rich practice embedded in institutional governance. This evolution has been shaped by widely adopted reference frameworks. The Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) define robust expectations for internal quality assurance (IQA), external quality assurance (EQA) and QA agencies, emphasizing student-centered learning, fair and transparent assessment, information management and public information (ENQA, 2015). In Africa, the African Standards and Guidelines for Quality Assurance (ASG-QA) localize these principles, placing institutional responsibility at the center and explicitly addressing the quality of open and distance learning in diverse system contexts (African Union Commission/HAQAA, 2018). Together, ESG and ASG-QA have helped reframe QA from a periodic accreditation exercise to an ongoing culture of evidence and improvement.

Complementing these reference standards, ISO 21001:2018 the international standard for Educational Organizations Management Systems (EOMS) codifies how educational providers can structure and document their processes around the Plan–Do–Check–Act (PDCA) cycle. Whereas ESG/ASG-QA articulates *what* good quality processes and outcomes should look like, ISO 21001 provides an auditable chassis for *how* to operationalize them: leadership and policy, stakeholder needs analysis, objectives and planning, competence management, operational control, performance evaluation, and continual improvement **(**ISO, 2018). In effect, ISO 21001 translates high-level QA expectations into consistent procedures, roles, records and evidence trails conditions that make quality both manageable and visible.

Across the continent, national and institutional reforms are increasingly data-enabled. Ministries and universities are investing in Education Management Information Systems (EMIS) and higher-education variants (e.g., HEMIS) to standardize indicator definitions, automate data flows and support dashboards for strategic and academic decision-making. The World Bank's recent EMIS 2.0 guidance underlines the need for interoperable architecture, clear data stewardship and analytics that inform learning, accountability and resource allocation—precisely the capacities that IQA/EQA cycles rely on (World Bank, 2024**)**. This turn toward EMIS-enabled monitoring helps QA move from retrospective reporting to continuous performance and risk management.

The Cameroonian policy context exemplifies these dynamics. The Education and Training Sector Strategy (ETSS) 2023–2030 and the National Development Strategy (NDS30) 2020–2030 set directional targets for the system: expanding access (students per 100,000 inhabitants), improving student–staff ratios, accelerating STEM participation, and professionalizing distance and digital learning. These ambitions carry immediate QA implications from curriculum design and assessment integrity to staff competence, laboratory safety, privacy/security in learning analytics and transparent public information (MINEPAT, 2023; Government of Cameroon, 2020**)**. Notably,

the ETSS is explicitly positioned as the sectoral arm of NDS30, aligning education reforms with Cameroon's broader goals of inclusive growth and structural transformation through 2030.

Operationally, the challenge is not only to set strategic targets, but to *couple* them to standards, processes and evidence. Here, a practical division of labor is useful. ESG/ASG-QA supply normative guidance for IQA/EQA and public reporting; ISO 21001 turns those expectations into documented, auditable processes and PDCA routines; and EMIS/HEMIS provide consistent indicator definitions (KPI dictionaries), data lineages and dashboards. When these elements are aligned, executives and senates can review performance routinely, departments can run local PDCA cycles, and QA units can track corrective and preventive actions against clear thresholds and time-bound plans. The result is a shift from one-off accreditation to continuous improvement and accountability an approach echoed in recent system frameworks such as South Africa's Quality Assurance Framework (QAF), which emphasizes risk-based, proportionate oversight and the simplification of QA processes while increasing institutional responsibility (Council on Higher Education, 2023).

For Cameroon, the implications are concrete. Access growth demands credible capacity modeling and admissions governance, plus IQA processes that check equity of participation and success across regions, genders and socio-economic groups (ENQA, 2015; MINEPAT, 2023). Improved supervision ratios require integrated human resource planning, workload policies and continuing professional development (CPD) to ensure that staff competence keeps pace with enrollment expansion, consistent with ISO 21001's clauses on competence, support and operational control (ISO, 2018). STEM expansion translates into curriculum redesign, laboratory safety protocols, procurement and maintenance standards, and industry partnerships for authentic learning all of which must be captured in program-level IQA documentation and EQA evidence (African Union Commission/HAQAA, 2018). Distance and digital learning necessitate published course-design templates, academic integrity policies (including remote proctoring where appropriate), accessibility and inclusion guidelines, and privacy/security controls for learning management system (LMS) data and analytics—areas explicitly signposted in ESG's information-management expectations and EMIS 2.0 guidance on data governance (ENQA, 2015; World Bank, 2024).

In this article we adopt an integrationist stance: QA is strongest when strategic planning (vision, targets, resources, review) is coupled to QA cycles (standards, evidence, evaluation, feedback, improvement) and underwritten by ISO 21001's PDCA discipline and EMIS-enabled data governance. For policymakers, this means translating NDS30 and ETSS targets into national KPI dictionaries, stewardship roles and sector dashboards that reduce reporting burdens and enable comparable, timely monitoring (MINEPAT, 2023; Government of Cameroon, 2020). For institutional leaders, it means embedding QA into line management having deans and heads of department own PDCA reviews; QA units curating data and evidence; committees using dashboards to interrogate performance and risk; and public communication of outcomes (self-evaluation reports and EQA findings) to strengthen trust. The convergence of ESG/ASG-QA norms, ISO 21001 process discipline and EMIS-based analytics provides a pragmatic route to achieve this integrated quality culture.

LITERATURE REVIEW

Recent research syntheses emphasize equity-aware and human-centered learning analytics (LA) and AI design, highlighting that dashboards must be usable, ethically governed, and pedagogically actionable (Alfredo et al., 2024; Williamson & Kizilcec, 2022). Systematic and design-science studies demonstrate how specific dashboard features support self-regulation and goal-setting, while calling for stronger validation and alignment with course-level interventions (de Vreugd, van Leeuwen, Jansen, & van der Schaaf, 2024). These insights inform the evidence-dashboard layer of the coupling model advanced in this paper.

This literature reviews how QA in higher education has shifted from episodic compliance to continuous, evidence-led improvement. It synthesizes the European ESG and Africa's ASG-QA to clarify expectations for internal and external QA as well as for QA agency practices. ISO 21001's Educational Organization Management System (EOMS) standard is presented as the PDCA-based process scaffold that operationalizes those standards.

Strategic planning as the engine of quality: Strategic planning in universities links mission and vision to measurable goals, resource choices, and accountability routines. A robust plan does more than list aspirations; it defines key performance indicators (KPIs) with formulas, baselines, targets and owners; assigns risk controls; and establishes review cadences so that evidence can guide action. This logic is consistent with the ESG, which requires transparent information management, fair and reliable assessment, and regular internal review (internal quality assurance) complemented by external quality assurance processes and agency standards **(**ENQA, 2015**)**. ESG thus provides a normative "what" for quality student-centered design and delivery, assessment integrity, public information, and continuous monitoring while leaving room for local implementation.

In African systems, the ASG-QA translates these expectations for diverse institutional contexts and explicitly addresses open and distance learning, flexibility, and proportionality of evidence. ASG-QA's non-prescriptive guidance emphasizes institutional responsibility and peer-review capacity, positioning IQA and EQA as interlocking cycles rather than episodic audits **(**African Union Commission/HAQAA, 2018). Updated explanatory materials in 2024–2025 reaffirm these principles and their role within the Pan-African Quality Assurance and Accreditation Framework. Taken together, these frameworks recast strategic planning as a quality engine: goals and initiatives must be evidence-bearing (defined indicators, data sources, dashboards), auditable (documents, roles, records) and improvable (feedback loops).

Literature increasingly links effective strategy execution to the quality and governance of underlying data, hence the growing prominence of EMIS/HEMIS to standardize definitions and automate data flows into executive and academic dashboards. The World Bank's EMIS 2.0 knowledge pack synthesizes these requirements—enterprise architecture, stewardship, interoperability and role-based analytics for learning, accountability and resource allocation **(**World Bank, 2024**)**.

Frameworks for quality – ESG and ASG-QA: The ESG (2015 revision) define three domains for quality standards: Part 1 covers IQA (e.g., program design, student-centered learning, assessment, resources, information management, public information), Part 2 covers EQA (evaluation of programs/institutions, review methods, reporting, follow-up), and Part 3 covers QA agencies (independence, processes, integrity, resources, and agencies' own quality assurance) (ENQA, 2015). The ESG's emphasis on student-centered learning and fair, transparent assessment has had a durable impact on program design, including the expectation that learning outcomes, teaching/learning activities and assessments are constructively aligned and regularly reviewed using evidence.

The ASG-QA extends this logic across African higher education systems. It details expectations for IQA (e.g., program approval and review; teaching, learning and assessment; student support; information management) and EQA (self-evaluation reports, peer review visits, reporting and follow-up). It also includes internal QA guidelines for agencies and explicitly recognizes the quality of open and distance learning (ODL), a domain of rapid expansion on the continent (African Union Commission/HAQAA, 2018**)**. In practical terms, ASG-QA reinforces institutional responsibility and encourages proportionate evidence: right-sized data and documentation commensurate with the risk and scale of each activity. These frameworks are complementary rather than competing. ESG articulates broad expectations used widely within and beyond Europe; ASG-QA emphasizes contextual relevance in Africa. Both call for transparent public information, reliable assessment, and periodic self-evaluation with documented follow-up—conditions that presuppose repeatable processes and trustworthy data.

From principles to process – ISO 21001 and PDCA: While ESG/ASG-QA describe *what* quality involves, the ISO 21001 standard provides a *how*: an auditable EOMS aligned to the PDCA cycle. ISO 21001:2018 specifies requirements for leadership and policy, stakeholder needs analysis, objectives and planning, support and competence, operational control, performance evaluation, and improvement. This creates traceability between strategy and day-to-day academic operations—policies, procedures, records and evidence that can be audited internally and externally (ISO, 2018). Recent ISO communications note that ISO 21001 is undergoing maintenance (with a 2025 edition planned and withdrawal of a 2024 amendment), signaling ongoing evolution of the standard while retaining its PDCA core.

Adopting ISO 21001 can reduce the transaction costs of ESG/ASG-QA compliance by standardizing documentation and clarifying ownership for key processes (e.g., program approval, curriculum change control, assessment moderation, staff competence, information security). The standard's emphasis on stakeholder satisfaction (learners, employers, society) also aligns with ESG expectations on public information and external stakeholder engagement.

Data, dashboards and learning analytics: A second body of literature focuses on learning analytics dashboards (LADs) and management dashboards for quality. Systematic reviews show that dashboards can support learners' self-regulated learning and inform instructors' and administrators' decisions, but effects depend on design quality (valid indicators, actionable

visualizations, feedback integration) and ethical use (ensuring privacy and avoiding bias) (de Vreugd et al., 2024; Kaliisa et al., 2024; Williamson & Kizilcec, 2022). Recent open-access reviews argue that LADs are maturing yet require tighter integration with learning science, clearer theories of action, and evaluation beyond short-term engagement metrics (Masiello et al., 2024). The World Bank's EMIS 2.0 work complements this micro-level perspective with a macro-level blueprint for interoperable architectures, role-based access controls, and data stewardship—analytics capacities that serve both accountability and learning, crucial for IQA/EQA cycles and for governance dashboards used by executives and senates (World Bank, 2024). Meanwhile, sector syntheses on "big data for QA" highlight both opportunities and pitfalls: improvements in monitoring quality versus risks of data quality issues, fragmentation, or inequity if governance is weak (Sorour & Atkins, 2024).

In practice, dashboard ecosystems in higher education span: (1) administrative indicators (enrollment, progression, completion, equity gaps, staffing, budgets); (2) academic quality indicators (curriculum approval and review cycles, assessment moderation, external examiner feedback, student surveys); and (3) ODL and learning analytics metrics (LMS activity, student engagement, formative assessment signals). The literature stresses the importance of KPI dictionaries (clear definitions, formulas, thresholds), stewardship roles, and audit trails—all core to data governance under EMIS 2.0. These components ensure that data driving the dashboards are reliable and used ethically.

MATERIAL AND METHOD

Design and Overall Approach

We conducted a desk-based integrative synthesis of normative quality frameworks, policy documents, and implementation exemplars relevant to higher education quality assurance. The synthesis combined five source streams: (1) the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), which set expectations for internal QA (IQA), external QA (EQA) and QA agencies; (2) the African Standards and Guidelines for Quality Assurance in Higher Education (ASG-QA), the pan-African reference published in 2018 (with additional explanatory materials in 2024–2025) focusing on implementation and contextualization; (3) ISO 21001 (the EOMS standard) that implements PDCA at the process level; (4) Cameroon's sectoral strategy documents (notably the Education and Training Sector Strategy 2023–2030 aligned with the National Development Strategy 2020–2030); and (5) system-level implementation exemplars such as South Africa's Quality Assurance Framework (QAF) and data infrastructure (HEMIS/PowerHEDA) alongside the World Bank's EMIS 2.0 guidance on data governance and analytics for decision-making.

The goal of the synthesis was pragmatic: to derive a Strategy–QA Coupling procedure that translates system and institutional targets into standards-mapped processes, indicators, and auditable evidence trails implementable with EMIS-enabled dashboards. Rather than estimate causal effects, we focused on traceability—from policy targets to processes and evidence—so that results are reproducible by institutional teams and can be audited by external reviewers.

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Source Identification and Eligibility Criteria

We defined inclusion criteria *ex ante*. For normative standards, we required the latest official versions or authoritative summaries: ESG 2015 from ENQA/EHEA; ASG-QA 2018 plus HAQAA explainer decks (2024/2025) for updated implementation guidance; and ISO 21001 from ISO's official catalogue (noting the 2018 edition and indications of a 2025 update in progress). For policy sources, we included Cameroon's ETSS 2023–2030 (from Planipolis or official government portals) and NDS30. For implementation exemplars, we used primary Council on Higher Education (CHE) QAF documents (the 2022 framework notice and 2023 QAF Information Booklet) and public HEMIS/PowerHEDA dashboard portals evidencing system uptake. For data and analytics guidance, we included the World Bank's EMIS 2.0 knowledge pack materials (2024). We excluded derivative commentaries when a primary source was available, and non-official web posts that duplicated official content.

To minimize staleness and ensure currency, we prioritized sources in use as of 2023–2024: ESG 2015 (still the operative text), ASG-QA 2018 with 2024–2025 HAQAA updates, ISO's active information on ISO 21001 (2018 edition and maintenance status), Cameroon ETSS 2023–2030 (released 2023), CHE QAF 2022/2023 documents, and EMIS 2.0 (2024). Public PowerHEDA pages across several South African universities (e.g., national summary dashboards and institutional dashboards) were reviewed as implementation corroboration, but used cautiously and only for examples, since they are live data portals rather than static documents.

2.3 Data Extraction Protocol

We designed a two-layer extraction template for content analysis:

- **Layer A: Standards/Requirements.** From ESG, we extracted all Part 1 (IQA), Part 2 (EQA) and Part 3 (QA agency) standards, noting recurring cross-cutting requirements (e.g., student-centered learning, assessment integrity, information management, public information). From ASG-QA, we extracted expectations from Part A (IQA), Part B (EQA) and Part C (QA agencies), with specific attention to guidelines on open and distance learning (ODL) quality. From ISO 21001, we extracted its major clause families: context and stakeholders; leadership and policy; planning and objectives; support/competence; operations; performance evaluation; and improvement (all aligned with PDCA).

- **Layer B: Policy and Implementation Targets, plus Data Governance.** From Cameroon's ETSS, we extracted key higher-education targets (e.g., participation rates, student–staff ratios, STEM enrollment share, distance-learning professionalization) and associated governance levers. From the CHE QAF, we extracted its core principles (risk-based, proportionate oversight; simplification; enhanced institutional responsibility) and any signals about building a QAF-MIS/dashboard system. From the World Bank's EMIS 2.0 guidance, we extracted minimum capabilities for data interoperability, stewardship roles, access controls, KPI dictionaries, and analytics for decision-making. From the HEMIS/PowerHEDA portals, we recorded representative dashboard components and

typical "perspectives" (e.g., student success metrics, planning indicators, equity/disaggregation views) as examples of routinized evidence use in practice.

Two reviewers (the authors) piloted this extraction template on a sample source from each stream and reconciled interpretations to ensure consistency before full extraction, thereby reducing subjectivity in how sources were coded.

Mapping Procedure

We developed a five-step mapping procedure to operationalize the Strategy–QA Coupling model:

Step 1 – Target deconstruction: For each strategic target (for example, "increase STEM enrollment share"), we specified the KPI definition and formula, baseline value, annual milestones and final 2030 target, and required disaggregation (e.g., by gender, region, socio-economic status) to reflect ESG's equity and public-information expectations and EMIS 2.0's data stewardship logic.

Step 2 – Standards alignment: We aligned each target to relevant ESG/ASG-QA standards – for instance, a target on STEM enrollment growth links to standards on programme design/approval, student-centered learning, assessment, resources, information management, and public information – as well as to EQA follow-up expectations (such as content of self-evaluation reports, site visit focus, reporting and action plans). Where distance learning is implicated in a target, we cross-checked ASG-QA's explicit ODL standards to ensure inclusion.

Step 3 – ISO 21001 clause translation: Each target (and its aligned ESG/ASG-QA standards) was translated into ISO 21001 process requirements. This included identifying relevant policy statements, stakeholder needs assessments, objectives and planning elements, required staff competencies/CPD, operational controls (e.g., assessment moderation processes), performance evaluation mechanisms (monitoring indicators, internal audit requirements), and improvement actions. The result was a PDCA-traceable process inventory linking each strategic objective to concrete processes and evidence requirements.

Step 4 – Evidence and dashboard specification: For each process identified in Step 3, we specified the necessary evidence artifacts (e.g., curriculum approval meeting minutes, assessment moderation samples, external examiner reports, laboratory safety checklists, CPD attendance logs) and data elements (indicator numerators/denominators, thresholds or targets, update frequency, system-of-record for data). We then sketched role-based dashboard views that would display these data: for example, an executive or senate-level dashboard, faculty/department-level dashboard, and QA unit monitoring dashboard. These dashboard specifications drew on EMIS 2.0 principles and South African HEMIS/PowerHEDA practices of providing tiered, role-appropriate analytics.

Step 5 – EQA integration and public information: Finally, we mapped how the internal QA dashboards and documentation would feed into external QA processes under ESG/ASG-QA. This included the flow from internal dashboards and records into the self-evaluation report (SER) for accreditation, evidence provided during peer review visits, external review reports, and follow-up

action plans. We ensured that public information requirements (e.g., publishing key statistics or summaries of reports) were embedded, to maintain transparency as called for by both ESG and ASG-QA.

All mappings were recorded in a matrix (with dimensions of targets × ESG/ASG-QA clauses × ISO 21001 processes × evidence × dashboard views), which provides a reproducible blueprint for institutions to trace any strategic objective through to quality standards, processes, and evidence.

Triangulation and Consistency Checks

We triangulated our mappings in two ways. Conceptual triangulation compared ESG and ASG-QA clauses to identify convergences and divergences (for example, both frameworks stress student-centered learning and assessment integrity; ASG-QA adds explicit guidance on ODL). Process triangulation checked that ISO 21001's PDCA-based clauses aligned with QA agency expectations for follow-up and continuous improvement. Where the CHE QAF documents specified principles like risk-based, proportionate oversight and the use of QA dashboards in a QAF-MIS, we verified that our mapping matrix included a "risk" column (noting likelihood, impact, and controls for each target) and identified a dashboard owner and refresh cadence, reflecting those principles.

To ensure data-governance alignment, we checked that every KPI indicator in the mapping had a defined system-of-record, a designated data steward, a note on data lineage or audit trail, and appropriate access controls—meeting EMIS 2.0 minimum requirements. For the HEMIS/PowerHEDA exemplars, we reviewed the publicly available instances to confirm that the types of executive and planning dashboard views we proposed (e.g., cohort progression, equity gap analysis, enrollment trends) are grounded in what is already practiced, thereby reinforcing realism and feasibility.

Illustrative Planning Arithmetic

To demonstrate how high-level targets translate into resource and process requirements, we included simple illustrative calculations using proportional models. For example, we examined what is required to improve a student–staff ratio from 50:1 to 48:1 given a certain enrollment growth rate, and what it means to double the STEM enrollment share from 30% to 60%. For each example, we identified the capacity implications (e.g., additional faculty hiring, laboratory/workshop provision), process updates needed (curriculum redesign, assessment moderation protocols, expanded CPD programs), and new or enhanced data/QA artifacts to be created (such as tracking tools for student–staff ratios or STEM outreach program logs). These calculations are illustrative—not predictive—but they make the operational consequences of strategic targets explicit within PDCA cycles and dashboard alerts. The emphasis on clear definitions, threshold-setting, and update cadence in these examples mirrors best practices from EMIS 2.0 and QAF-MIS, where targets are tied to specific indicators and regularly monitored for progress.

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RESULTS

Cameroonian QA Architecture and Reforms

In Cameroon's higher education sector, the Ministry of Higher Education (MINESUP) oversees QA through the Directorate of University Accreditations and Quality (DAUQ), which issues QA guidelines and minimum standards and coordinates evaluation and accreditation activities. Recent country mappings and regional initiatives (e.g., CAMES in Francophone Africa) note progressive development of national QA instruments and discussions toward establishing an autonomous national QA agency to bolster external review impartiality (MINESUP/DAUQ, 2019; African Union Commission/HAQAA, 2018). This governance architecture—comprising policy mandates, standards, guidance, and oversight mechanisms—creates favorable conditions for embedding QA into university strategic planning cycles.

Sector Targets and Proportional Effects

Cameroon's ETSS 2030 sets measurable indicators for higher education. Selected examples include: students per 100,000 inhabitants rising from 1,529 (2021) to 1,700 (2030), an increase of ~11%; the student–teacher ratio improving from 50:1 to 48:1; the share of students in STEM doubling from 30% to 60%; private higher education's share of enrollment increasing from ~20% to 25%; and the expansion of distance-learning offerings (MINEPAT, 2023).

From a QA perspective, each of these targets implies specific auditable changes: capacity planning and equity tracking for access expansion; staffing norms and CPD programs for supervision improvements; curriculum and assessment standards, laboratory safety protocols, and industry partnerships for STEM growth; strengthened accreditation oversight and internal QA maturity for the growing private sector; and course design standards, e-proctoring and academic integrity measures, and data privacy protections for the digital learning expansion (ENQA, 2015; ISO, 2018; Council on Higher Education, 2023).

Table 1. Selected ETSS 2030 higher-education KPIs and required QA linkages.

KPI (by 2030)	Baseline → Target	Required QA-linked changes (illustrative)	Source
Students per 100,000 inhabitants	1,529 (2021) → 1,700 (2030)	Capacity expansion models; standards for facilities and staffing; equity KPIs for access	MINEPAT, 2023
Private HE share of enrollment	~20% → 25%	Strengthen accreditation oversight; improve private HEIs' IQA maturity and reporting	MINEPAT, 2023
Student–teacher ratio	50:1 → 48:1	New staffing norms; updated workload policies; track CPD and recruitment against targets	MINEPAT, 2023
STEM share of students	30% → 60%	Curriculum & assessment redesign; lab safety QA protocols; externship MoUs with industry	MINEPAT, 2023
Digitization & distance learning	qualitative expansion	Online course design standards; assessment integrity (remote proctoring); data privacy & security policies	MINEPAT, 2023

As Table 1 suggests, achieving an 11% increase in access (students/100k) requires either expanding capacity (more institutions, classrooms, instructors) or improving internal efficiency (better progression and completion rates). Improving the supervision ratio from 50:1 to 48:1 implies hiring additional academic staff or restructuring faculty workloads. Doubling the STEM participation share will involve both demand-side interventions (student outreach, bridge programs for STEM readiness) and supply-side readiness (investments in labs, safety measures, faculty expertise in STEM fields). Each target cascades into concrete QA actions and artifacts that can be planned, monitored, and audited.

Dashboards and Data Infrastructures

Aligned with EMIS 2.0's *learning-and-accountability* architecture, institutional dashboards should be built on a robust KPI dictionary, clear data lineage, and role-based views that prioritize formative use of data while safeguarding privacy (World Bank, 2024). In practice, when QAF-style external QA and ISO 21001-based internal PDCA cycles are both in place, they become coherent and mutually reinforcing if learner-centered indicators and equity disaggregations are embedded into program reviews and course-level assessment loops (Council on Higher Education, 2023).

South Africa's CHE QAF illustrates a shift toward continuous oversight supported by management information systems (MIS) and dashboards. Implementation protocols and training for the QAF were rolled out in 2023–2024, emphasizing routine data reporting and risk flags (Council on Higher Education, 2023). Meanwhile, the HEMIS reporting layer, exemplified by PowerHEDA, shows how standardized data can feed executive dashboards for trend analysis, cohort tracking, and risk identification. Public-facing PowerHEDA portals at various universities demonstrate typical views (e.g., cohort progression rates, demographic distributions, enrollment trends), illustrating how administrative data can be repurposed as continuous QA evidence beyond periodic accreditation reports. Globally, EMIS dashboard initiatives highlight the centrality of data governance, interoperability standards, and designated stewardship roles in ensuring reliable data for sector steering (World Bank, 2024). Cameroon's ETSS 2030 itself calls for new *steering tools* and performance contracts, which could be translated into institutional dashboards aligned with national indicators (MINEPAT, 2023).

Table 2. Examples of dashboards supporting QA practices in different contexts.

Jurisdiction	What the dashboard does	QA use case	Source
South Africa (CHE QAF-MIS)	Visualizes institutional data; tracks EQA decisions	Continuous monitoring; risk-flagging; follow-up on reviews	CHE, 2023
South Africa (HEMIS/PowerHEDA)	Converts HEMIS datasets into strategic and operational reports	Performance trends analysis; cohort tracking; equity monitoring	PowerHEDA, 2022
Global (World Bank EMIS 2.0)	Tracks EMIS maturity and system operations	Sector readiness assessment; policy benchmarking across countries	World Bank, 2024

The examples in Table 2 underscore that dashboards can serve multiple QA purposes: internal improvement (by tracking key performance metrics over time), external oversight (by highlighting risk areas or compliance status), and sector benchmarking (by comparing institutions or monitoring national targets). Crucially, all these uses depend on high-quality data and a clear governance framework for how data are collected, shared, and interpreted in context.

Regional Comparators

Beyond Cameroon and South Africa, other African countries offer useful QA comparators. In East Africa, for example, Kenya's Commission for University Education (CUE) and Rwanda's Higher Education Council (HEC) have institutionalized regular IQA and periodic EQA processes, underpinned by guidelines that emphasize stakeholder engagement, student-centered learning, and public disclosure of QA outcomes (Commission for University Education, 2014; Higher Education Council, 2021). These systems demonstrate the value of transparent, published standards and of disseminating review results for legitimacy and cross-institutional learning. They also highlight the importance of capacity-building for institutions to conduct self-assessments and for peer reviewers to evaluate evidence consistently.

ISO 21001 as an Operational Chassis

ISO 21001 operationalizes the strategy–QA coupling by converting strategic targets into auditable processes and evidence streams. Table 3 provides a mapping of exemplar Cameroonian strategic targets to ISO 21001 clauses and associated IQA/EQA evidence.

Table 3. How strategy targets flow through ISO 21001 processes to QA evidence.

Strategic target	ISO 21001 clauses (simplified)	QA evidence streams (IQA/EQA)
Access: 1,700 students/100k	Policy & objectives; resource planning; operations; monitoring	Admissions capacity plans; equity KPI tracking; enrollment audit logs
Supervision: 50:1 → 48:1	Competence (staffing); operations; performance evaluation	Faculty staffing norms; workload policy documents; CPD records; ratio trendlines in dashboard
STEM share: 30% → 60%	Curriculum design; resources; operations	Lab standards and safety audit reports; updated curriculum blueprints; industry externship MoUs; assessment moderation reports
Distance learning expansion	Design & delivery; evaluation; information security	Online course templates; remote proctoring and academic integrity policies; learning analytics dashboards; privacy compliance records

As shown in Table 3, ISO 21001 provides a structural "chassis" for aligning everyday operations with strategic goals. For instance, a target on expanding access (1,700 students per 100k population) is reflected in ISO clauses on planning and operations, which in practice means having admissions capacity plans, equity monitoring indicators, and audit logs of enrollment management. A target on the student–teacher ratio falls under ISO's human resource competence and performance evaluation clauses, translating to concrete evidence like staffing plans, workload policies, CPD (training) logs to ensure teacher quality scales with quantity, and monitoring of the ratio over time. Similarly, a STEM expansion target maps to curriculum and resource clauses, implying evidence such as documented curriculum revisions for new STEM programs, lab equipment standards and safety audit checklists, signed memoranda with industry partners for internships, and records of assessment blueprint alignment to STEM competencies. Finally, expanding distance learning touches on design, delivery, and information security clauses, meaning institutions need course design templates reflecting quality standards, proctoring and academic integrity policies for online exams, analytics that track student engagement in virtual environments, and compliance documents for data privacy/security in LMS platforms.

This mapping exercise demonstrates that strategic objectives can be systematically decomposed into institutional processes and evidence, providing a clear line of sight for auditors and QA reviewers from high-level goals down to on-the-ground practice.

DISCUSSION

Governance and Leadership for Quality Culture

Quality cultures emerge when leadership ensures coherence among strategy, resources, and evidence. University executives must translate national or sector targets into institutional KPIs and

quality objectives; deans and heads of department should own local PDCA cycles for continuous improvement; and QA units should curate evidence and facilitate honest self-review. Performance contracts (agreements setting goals for institutional leaders) are most effective when paired with dashboard visibility and opportunities for peer learning **(**ENQA, 2015; OECD, 2020). In Cameroon's case, ETSS 2030 provides the mandate for integrating such governance arrangements into university management (MINEPAT, 2023). For example, university councils could tie a portion of funding or leadership evaluation to progress on KPIs displayed in dashboards, thereby reinforcing accountability. Leadership commitment is also crucial for breaking down silos—ensuring that academic departments, IT/data units, and QA offices collaborate on data quality and improvement actions rather than work at cross-purposes.

Data Governance and Learning Analytics

Effective dashboards depend on data quality and governance. Institutions require a formal KPI dictionary (with agreed definitions, formulas, disaggregation requirements, and thresholds for each metric), designated data stewards for each data domain, controlled access rights for sensitive information, and audit trails for data modifications. Learning analytics can add granularity by tracking student engagement, assessment patterns, and progression, which support targeted student success interventions. The South African HEMIS/PowerHEDA experience shows that even standardized administrative datasets, when combined with a powerful BI tool, can inform strategic decisions and day-to-day management (PowerHEDA, 2022; World Bank, 2024). However, the introduction of learning analytics and AI tools in QA must be accompanied by governance frameworks addressing privacy, bias, and the pedagogical validity of the measures used. Data governance in a quality context means treating information as a critical asset: data cleaning, protection, and appropriate use become part of the QA agenda. Regular data quality audits and updates (for example, ensuring enrollment data is up to date for the latest semester before making decisions) should be routine in QA committees.

Change Management and Staff Capability

QA reforms are as much social and organizational as they are technical. Faculty and staff need to buy into new processes and tools. This requires capacity-building in areas like assessment literacy (e.g., designing fair and valid assessments, using rubrics), constructive alignment of teaching with learning outcomes, academic integrity (especially with new challenges like AI-assisted cheating), and inclusive pedagogy for diverse and digital learning contexts. ISO 21001's clauses on competence and awareness provide a structured mechanism for planning such continuing professional development (CPD) and evaluating its impact (ISO, 2018). Change management efforts work best when they yield tangible benefits for staff: for instance, introducing a standardized course template that reduces instructors' workload or providing an early-alert dashboard that helps faculty identify at-risk students more easily. Early "wins" – such as a department using data to improve a course pass rate or close an equity gap – should be celebrated and shared to build momentum. Moreover, involving staff in the design of QA processes (through committees or pilot projects) can improve buy-in and practicality. Recognizing and rewarding

effective engagement in QA (e.g., through promotions criteria that value contributions to curriculum improvement or mentoring) is another way to embed the culture.

Resource Constraints and Financing

Achieving targets like expanded access, STEM growth, and digital transformation requires significant resources, both capital and operational. Financing options may include targeted government grants, competitive funds for program modernization, partnerships with industry (especially for STEM infrastructure and internships), and public–private partnerships for technology and facilities. A robust QA system can *de-risk* these investments by verifying readiness and tracking implementation. For instance, before a major expansion, QA protocols might require a lab readiness checklist to be completed and externally verified for any new STEM program. Likewise, phased rollouts (pilot, evaluate, scale) can be built into strategic plans, with QA monitoring each phase. External QA agencies and accreditation bodies can also contribute by including resource feasibility in their criteria – ensuring that institutions do not launch initiatives without sustainable financing or minimum resource standards. In settings of scarce resources, prioritization is crucial: QA data can help identify which interventions yield the most improvement per dollar (for example, investing in faculty development might improve learning outcomes more than investing in fancy buildings). Thus, QA evidence should inform budget decisions, creating a feedback loop between finance and quality. Overall, aligning QA with financing means that quality improvements are explicitly costed and funded, and conversely, that funding allocations are justified by quality gains.

Equity, Inclusion, and Relevance

Expanding access is only a true success if it translates into equitable student success. Therefore, dashboards and reports should disaggregate key indicators by gender, socio-economic status, region, disability, and other relevant categories to identify any widening gaps. For example, if overall completion rates improve but the gap between urban and rural students widens, the QA system needs to flag that and prompt investigation and action. Inclusion also extends to pedagogy and support: QA reviews should check if curriculum and teaching methods are inclusive of diverse learners. Program relevance is another facet of quality – evidenced through graduate employability, employer feedback, tracer studies of alumni, and active industry advisory boards for curricula. Both the ASG-QA and ESG frameworks call for stakeholder engagement and publicly accessible information, which ties quality to societal needs and accountability (ENQA, 2015; African Union Commission/EU/HAQAA, 2018). Institutions might publish annual "quality reports" that include not just internal metrics but also survey results from students and employers, demonstrating responsiveness to feedback. Embedding equity means setting specific improvement targets (e.g., halving the performance gap between different student groups) and tracking them like any other KPI. Embedding relevance means each program periodically reviews and updates its content and outcomes in consultation with industry and community representatives, and these activities are documented and evaluated in QA processes.

Implications

System-level implications: Ministries and quality councils can accelerate quality gains by standardizing the informational backbone of the sector. For example, publishing a national higher-education KPI dictionary (with clear definitions, required disaggregations, target thresholds, data refresh schedules, official data sources, and stewardship assignments) would reduce institutional reporting burdens, improve data comparability, and underpin credible IQA/EQA cycles. Establishing basic validation rules and perhaps certifying institutional data pipelines (to ensure accuracy and completeness of submissions) would help ensure that self-evaluation reports and dashboards are built on trustworthy data. Oversight can become more *risk-based*: external QA reviews might be scheduled and scoped in proportion to risk signals such as very rapid enrollment growth, persistently low completion rates, or major shifts to online delivery. This mirrors modern frameworks that concentrate scarce peer-review resources where the quality risk (or impact on students) is highest. Building a centrally hosted EMIS/HEMIS analytics platform with role-based access for ministry, QA agency, and institutions could provide consistent "single source of truth" executive dashboards (for metrics like participation rate, student–staff ratio, completion, equity gaps) and allow adding program-level quality indicators over time. QA agencies might also encourage ISO 21001 adoption by mapping ESG/ASG-QA expectations to ISO clauses in a guidance document and perhaps offering incentives (like fast-track re-accreditation or recognition) for institutions that implement core ISO 21001 processes and pass internal audits. System credibility is further strengthened when institutions are required to publish key quality information – such as program specifications, summaries of self-evaluation reports, accreditation or audit results, and progress updates on action plans – on a national QA portal, fostering transparency and public trust.

Institution-level implications: University leaders should embed the Strategy–QA Coupling matrix directly into their planning and governance processes. Each strategic objective – whether it is access expansion, improved supervision ratios, higher STEM participation, or professionalized online learning – should be explicitly linked (in strategy documents and annual plans) to relevant ESG/ASG-QA standards, to ISO 21001 process requirements, to named evidence artifacts, and to dashboard indicators with responsible owners and update schedules. One practical approach is to require that any new initiative or project proposal includes a completed section of this matrix, ensuring "quality by design" and preventing well-meaning targets from drifting away from evidence and process. Data governance must be treated as a core quality function rather than a purely IT concern. A cross-functional data stewardship committee (including representatives from registry/admissions, exams and assessment, HR, finance, ICT/LMS administration, etc.) should own the institutional data definitions, ensure proper data lineage and security, manage user roles for data access, and report data-quality indicators (like data completeness or timeliness) alongside academic KPIs to the senate and council. Quality improvement ultimately happens in classrooms and departments, so faculties and departments should be empowered and expected to run their own quarterly PDCA reviews, documenting minutes, decisions and action items. The central QA unit can support these by curating evidence, providing training (for example on how to interpret

dashboard data or conduct assessment moderation), and verifying that follow-through on action plans actually occurs.

Because assessment and pedagogy are the hinge between strategy and student outcomes, institutions should prioritize CPD in areas like constructive alignment of learning outcomes, assessment moderation techniques (including for digital assessments), improving feedback quality to students, maintaining academic integrity (especially with the rise of AI tools), and inclusive teaching for both in-person and online modes. Completion of such CPD can be incentivized through workload models or career advancement criteria to normalize these practices. The expansion of STEM and distance learning programs needs careful sequencing and readiness checks. For STEM, this might include pre-launch certification that labs meet safety and equipment standards, that faculty with the requisite expertise are on board, and that industry partnerships for internships or project-based learning are formalized. For online learning, a readiness checklist might cover having standardized course design templates, ensuring all materials meet accessibility standards, having systems for verifying student identity and proctoring exams, and having privacy and cybersecurity audits for the LMS and analytics tools. Institutions should adopt a pilot–review–scale approach: pilot new initiatives, rigorously review outcomes, and scale up only when quality criteria are met. Importantly, publishing what worked and what did not (in internal reports or external presentations) turns early efforts into institutional learning rather than burying failures.

Implications for QA agencies and external reviewers: External quality assurance can increase its developmental value by focusing on the "living system" of an institution, not just its paper self-evaluation report. Site visits and desk reviews should probe whether the institution's dashboards and data practices align with its claims in the SER, and whether action plans are actually leading to observable improvements. For example, reviewers might sample evidence trails by looking at a program's recent changes: checking meeting minutes, new assessment plans, or updated syllabi to see if issues identified previously have been addressed. They might also ask institutions to present multi-year trend data and peer comparisons for key indicators like enrollment, completion, or review timeliness, shifting the dialogue from static compliance to improvement trajectory. After review cycles, QA agencies can strengthen sector-wide learning by publishing anonymized "good practice" notes highlighting effective templates, dashboards, or risk registers, and by hosting workshops or clinics for institutions working on similar improvements (e.g., implementing new ODL programs or integrating ISO standards). Such transparency and shared learning accelerate overall quality enhancement and reduce duplication of effort.

6. Conclusions

This paper has argued that strategic planning becomes a practical engine of quality assurance (QA) when it is explicitly coupled to recognized standards (ESG/ASG-QA), implemented through ISO 21001's Plan–Do–Check–Act discipline, and instrumented with governance-grade data via EMIS/HEMIS and role-based dashboards. The Strategy–QA Coupling matrix we developed provides traceability from policy targets to process owners, indicators, evidence artifacts and risks/controls, making quality work visible and auditable rather than episodic. Applied to

Cameroon's ETSS/NDS30 context, the approach converts system ambitions—such as access expansion, improved supervision ratios, STEM growth, and professionalized distance/online provision—into concrete, monitorable routines at institutional and program levels.

Three key implications follow. First, data governance is quality work: KPI dictionaries, data stewardship and refresh cadences must sit alongside curriculum and assessment policies if evidence is to be credible for IQA/EQA. Second, proportionate, risk-based oversight can lower burdens while improving assurance: institutions take ownership of robust internal processes and continuous improvement, while agencies focus on analyzing risk signals, ensuring data comparability, and verifying follow-up actions. Third, equity must be embedded, not appended: disaggregating data and public reporting on outcomes are necessary to ensure that expansion of access does not inadvertently widen achievement gaps.

The paper's tools—such as the mapping matrix, example dashboard layouts, and implementation checklists—are designed for immediate adoption and local tailoring by QA practitioners. They invite leadership teams to institute regular PDCA reviews at faculty and department level, to publish "Quality Information" pages (including SER summaries, accreditation/EQA statuses, and action-plan progress updates), and to use dashboards to interrogate trends over time rather than static snapshots. Future work should formally test the effectiveness and cost-effectiveness of the full coupling approach across multiple institutions, and continue to strengthen the privacy, security and ethical frameworks for the use of analytics and AI tools in educational environments. In summary, tightly coupling strategy, standards, process discipline and trustworthy data can deliver a durable, student-centered quality culture—one that supports growth, protects integrity, and continuously improves outcomes that matter to learners, employers, and society.

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REFERENCES

African Union Commission, European Union, & HAQAA Initiative. (2018). *African Standards and Guidelines for Quality Assurance in Higher Education (ASG-QA).* Retrieved from https://haqaa.aau.org/wp-content/uploads/2017/11/ASG_QA_March2018.pdf

Alfredo, R., et al. (2024). Human-centred learning analytics and AI in education. *Patterns, 5*(6), 100872. https://doi.org/10.1016/j.patter.2024.100872

Commission for University Education (Kenya). (2014). *Universities Standards and Guidelines, 2014.* Nairobi: CUE. (Available from CUE website)

Council on Higher Education. (2022, April 28). *A Quality Assurance Framework (QAF) for Higher Education in South Africa.* Pretoria: CHE. (Framework policy document)

Council on Higher Education. (2023, September 29). *Quality Assurance Framework (QAF) – Information Booklet.* Pretoria: CHE. Retrieved from

https://www.che.ac.za/sites/default/files/inline-files/Quality%20Assurance%20Framework%20%28QAF%29%20Booklet.pdf

de Vreugd, L., van Leeuwen, A., Jansen, R., & van der Schaaf, M. (2024). Learning analytics dashboard design and evaluation to support student self-regulation of study behaviour. *Journal of Learning Analytics, 11*(3), 249–262. https://doi.org/10.18608/jla.2024.8529

ENQA. (2015). *Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG).* Brussels, Belgium: European Association for Quality Assurance in Higher Education. Retrieved from https://ehea.info/media.ehea.info/file/ESG/00/2/ESG_2015_616002.pdf

Government of Cameroon. (2020). *National Development Strategy 2020–2030 (NDS30).* Yaoundé: Ministry of Economy, Planning and Regional Development. Retrieved from https://minepat.gov.cm/en/ova_doc/snd30-en/

Higher Education Council (Rwanda). (2021). *Guidelines for Internal Quality Assurance Mechanisms in Higher Education Institutions.* Kigali: HEC.

International Organization for Standardization. (2018). *ISO 21001:2018 – Educational organizations – Management systems for educational organizations – Requirements with guidance for use.* Geneva: ISO. Retrieved from https://www.iso.org/standard/66266.html

Kaliisa, R., Misiejuk, K., López-Pernas, S., Khalil, M., & Saqr, M. (2024). Have learning analytics dashboards lived up to the hype? A systematic review of impact on students' achievement, motivation, participation and attitude. In *Proceedings of the ACM Conference on Learning @ Scale 2024*, Article 3636884 (pp. 1–12). New York: ACM. https://doi.org/10.1145/3636555.3636884

Masiello, I., Korsa, P., Daza, V., Palma, F., Augustsson, H., & Rundquist, R. (2024). A current overview of the use of learning analytics dashboards. *Education Sciences, 14*(1), 82. https://doi.org/10.3390/educsci14010082

Ministry of Economy, Planning and Regional Development (Cameroon). (2023). *Education and Training Sector Strategy 2023–2030 (ETSS 2030).* Yaoundé: MINEPAT. Retrieved from https://planipolis.iiep.unesco.org/sites/default/files/ressources/cameroon_2023-2030%20education%20and%20training%20sector%20strategy.pdf

Ministry of Higher Education (Cameroon) – Directorate of University Accreditations and Quality. (2019). *Higher Education Quality Assurance Policy Guidelines.* Yaoundé: MINESUP/DAUQ. (Internal policy document)

OECD. (2020). *Resourcing Higher Education: Challenges, Choices and Consequences.* Paris: OECD Publishing. https://doi.org/10.1787/735e1f44-en

PowerHEDA. (2022). PowerHEDA Business Intelligence Dashboard for Higher Education [Web portal]. IDSC / South African Universities. (Accessed 2022 at various institutional sites.)

Sorour, A., & Atkins, A. S. (2024). Big data challenge for monitoring quality in higher education institutions using business intelligence dashboards. *Journal of Electronic Science and Technology, 22*(1), 100233.

Williamson, K. D., & Kizilcec, R. F. (2022). A review of learning analytics dashboard research in higher education: Implications for justice, equity, diversity, and inclusion. In

Proceedings of the 12th International Learning Analytics and Knowledge Conference (LAK22) (pp. 260–270). https://doi.org/10.1145/3506860.3506900