

Developing a Conceptual Framework for Quality Standards in E-Learning

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Abstract

Purpose: This study develops a conceptual framework for quality assurance in e-learning by identifying and integrating the principal standards reported in the theoretical and empirical literature. It seeks to establish a comprehensive basis for evaluating the institutional, pedagogical, technological, administrative, and learner-support dimensions of electronically mediated education.

Design/methodology/approach: The study adopts a descriptive-analytical approach based on a structured review and thematic synthesis of relevant theoretical literature and previous empirical studies. The identified standards were classified according to their functions within the e-learning system, including institutional governance, technological infrastructure, instructional design, digital content, faculty competencies, learner support, interaction, assessment, and continuous evaluation.

Findings: The synthesis demonstrates that e-learning quality is a multidimensional construct that cannot be assessed exclusively through technological performance. Effective quality assurance requires alignment among institutional strategy, reliable digital infrastructure, pedagogically grounded course design, accessible and interactive content, competent instructors, responsive technical and academic support, valid assessment procedures, and mechanisms for continuous improvement. On this basis, the study proposes an integrated set of quality domains capable of guiding the design, implementation, monitoring, and evaluation of e-learning systems.

Practical implications: The proposed framework may assist universities, quality-assurance bodies, instructional designers, faculty members, and e-learning administrators in developing evaluation instruments, accreditation criteria, institutional policies, and improvement plans. It may also support the systematic identification of deficiencies affecting the effectiveness and sustainability of digital education.

Originality/value: The study integrates previously fragmented approaches to e-learning quality into a unified conceptual framework. It emphasizes that quality emerges from the interaction among the educational

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institution, technological environment, instructor, learner, digital content, support services, and assessment system.

Keywords: E-learning; Quality standards; Quality assurance; Instructional design; Digital learning; Higher education

I. Introduction

Today, the world faces a series of rapid and consecutive challenges represented by scientific and economic advancements, in addition to the telecommunications and information revolution, which has led to a doubling of human knowledge in a remarkably short period. A major breakthrough has occurred in satellite technology, multimedia, and the Internet.

Education is considered one of the most vital fields impacted by technological development, giving rise to numerous new concepts and visions. Perhaps e-learning, being one of the most prominent educational innovations, is expected to assist in achieving quality in the educational process. Consequently, it has become a fundamental feature of many modern educational institutions. The quality of e-learning—defined as 'a co-production process between the e-learning environment, the learner, and the educational institution, ensuring that the output of the educational process is not adversely affected by the institution's production processes' (Ahmed, 2016)—has become an inherent consideration when discussing e-learning. The quality of this learning mode is realized through a set of standards; hence, the significance of quality standards in e-learning emerges, alongside the importance of this study, through its capability to produce distinguished e-learning aimed at convincing learners of the efficacy and strength of e-learning-based educational programs, as well as the learner's ability within these programs to communicate with teachers, interact with peers, and engage in interactive activities.

Employing e-learning and digital alternatives achieves quality in teaching and learning. The quality of this learning mode extends to cover the nature and methods of learning used, the degree of interaction between students, digital content, experts, and faculty to acquire knowledge and facilitate learning, as well as managing learning electronically and providing diverse opportunities to build learning environments rich in electronic resources. Educational institutions thus strive to manage e-learning practices in accordance with general educational quality standards and e-learning quality standards in particular, working to establish standards that enable them to ensure e-learning quality within the institution (Al-Hamdi, 2010).

Hence, there is an urgent need to identify quality standards in the e-learning system and prepare a list of these standards through a general proposed vision, which is the primary objective of the current study. The study seeks to answer the following research question:

Main Research Question: *What are the quality standards in e-learning?*

To achieve the objective of this study and answer its question, the researcher drew upon previous literature and empirical studies:

- **Ehlers (2004) Study:** Titled 'Quality in E-Learning from a Learner's Perspective'. The study aimed to clarify the domains of e-learning quality from the learners' perspective, focusing on seven main

domains and thirty sub-dimensions: teacher/tutor support (comprising 8 dimensions including learner-content compatibility, individual learner support, synchronous, and asynchronous communication media); course collaboration and communication (including social collaboration and continuous creative collaboration); technology (3 dimensions: adaptability/personalization, synchronous connectivity, and technical content availability); costs and expectations (5 dimensions: high expectations, necessity of online learning, program nature, and media utilization); information and transparency (3 dimensions: advice/guidance, information on objectives and content); course structure (3 dimensions: personal support in learning processes, introduction to technology and content, assignments, and tests); and evaluation/assessment (policies and procedures guiding e-learning assessment).

- **Davey & Yeung (2005) Study:** Presented a proposal for quality assurance in open higher education based on a survey of faculty members across open higher education institutions in Hong Kong. It highlighted the necessity of adopting 24 guidelines to ensure evaluation quality, categorized into seven main elements: institutional support, course development, teaching and learning processes, course components, student support, supervisor support, and periodic evaluation of the e-learning system. The study concluded with several recommendations and suggestions.
- **Al-Najdi (2012) Study:** Titled 'Evaluating the Quality of E-Learning at Al-Quds Open University in Light of International Quality Standards'. The study aimed to determine the compliance level of e-learning quality (educational, technical, and administrative) with global standards. The sample consisted of 84 supervisors supervising online courses and 1,554 students engaged in e-learning. Questionnaires measured 24 standards across four primary domains for supervisors and two domains for students. Results indicated that standards were present across educational, technical, and administrative domains, recommending the formal adoption and dissemination of e-learning standards.
- **Abu Khatwa (2012) Study:** Titled 'Quality Standards for Faculty Members' Utilization of E-Learning'. The study aimed to identify quality standards in faculty members' utilization of e-learning across seven domains: e-learning system, instructional design of e-resources, production of e-resources, e-learning evaluation, e-learning utilization, e-learning management, and e-learning ethics. A total of 93 standards were identified and validated by faculty members with importance ratings ranging between 90% and 100%, demonstrating their high significance.
- **Nada (2014) Study:** Titled 'The Level of E-Learning Management Quality at Al-Quds Open University from the Perspective of Faculty Members in its Northern West Bank Branches'. The study aimed to examine e-learning management quality levels and the impact of demographic variables (gender, qualification, college, residence). Out of 721 faculty members, a sample of 105 was surveyed using a 63-item questionnaire across five domains. Results showed that the highest mean scores were for e-learning training, whereas the lowest was for providing the e-learning environment.
- **Al-Hafiz (2014) Study:** Titled 'Quality Standards in the Online Learning Environment in Higher Education Institutions'. The study aimed to establish a list of standards for implementing online learning environments in higher education institutions by analyzing relevant literature. It identified

eight primary standards: quality of learning environment objectives, physical/software/human components, learning environment tools, instructional content design, university professor training and qualification, guidance and counseling for online students, socio-cultural relationships in the learning environment, and the physical environment.

- **Ammar (2015) Study:** Titled 'Virtual Classrooms and Requirements for Their Activation in Light of Quality Standards'. Using a descriptive approach, the study developed a quality-based virtual classroom model comprising 4 domains and 345 indicators: institutional support, technical/technological support, virtual classroom design (educational aspects), and virtual classroom design (technical aspects).
- **Affi et al. (2016) Study:** Titled 'Instructional Design Quality Standards for E-Learning Courses at Dammam University'. The study developed quality standards and evaluation models for instructional design in e-learning courses, defining 9 domains, 10 general standards, 20 sub-standards, and 170 performance indicators.
- **Al-Othman (2016) Study:** Titled 'The Extent of Applying Quality Standards in E-Learning Management at King Saud University from the Perspective of Leaders and Faculty Members'. Utilizing a descriptive survey of 355 faculty members, the study established ranked quality standards starting from physical resource quality to economic quality in e-learning management, recommending student training on modern technology applications.
- **Hijazi & Saad (2016) Study:** Titled 'Quality Standards for Virtual Classrooms (Blackboard Collaborate) from the Perspective of Faculty at King Saud University'. Using a survey method, the study developed a list of 10 main standards comprising 120 indicators to ensure virtual classroom quality.
- **Ahmed (2017) Study:** Titled 'Digital Design of Virtual Reality Technology in Light of E-Learning Quality Standards'. The study identified e-learning quality standards when digitally designing virtual reality to keep pace with digitalization, proposing 8 main standards and 54 indicators.

Commentary on Previous Studies

It is evident from the previous literature that studies have been conducted across diverse Arab and international educational settings, underscoring the global importance of e-learning quality. Furthermore, research in this domain emerged simultaneously with the deployment of modern educational technologies. The reviewed studies consistently converge on several major core pillars of e-learning quality: standards related to the integrated design of the e-learning system; quality standards for digital content and e-course design; quality standards for student performance and self-directed learning capability; standards regarding the competence and digital readiness of e-learning supervisors/instructors; electronic service quality; and standards associated with assessment and evaluation methodologies.

II. E-Learning

II.1 Concept of E-Learning

Specialists have not reached a single, universally unified definition covering all dimensions of 'E-Learning.' Most definitions reflect specific perspectives depending on the researcher's background, specialization, and objectives. Prominent definitions include:

- **Systemic Definition:** An educational system aimed at creating an interactive environment rich in applications based on computer technologies and the Internet, enabling students to access learning resources in the shortest time, with minimal effort, and maximum benefit, while enabling the management, control, measurement, and evaluation of student performance (Moghazi, 2015).
- **Zaitoun (2005):** Learning using modern communication mechanisms, including computers, networks, audio, video, graphics, electronic search engines, and Internet portals, whether distance-based or in-classroom, achieving maximum benefit with minimal effort and time (Zaitoun, 2005).
- **Kahil (2014):** A system for delivering educational and instructional programs via diverse technological media, including multimedia and the Internet, to enhance and facilitate learning anytime and anywhere, providing electronic multimedia tools (audio, image, video) to achieve educational goals (Kahil, 2014).

Author's Operational Definition: Learning based on the utilization of modern technologies, particularly computers and the Internet.

II.2 Characteristics of E-Learning

E-learning exhibits distinct characteristics encompassing the learning system, the teacher, the learner, and the educational environment:

- Presenting digital course content within a multimedia environment (written/spoken text, audio effects, animations, etc.).
- Easy accessibility of digital educational content via computer networks and multimedia tools.
- Achieving higher levels of interaction between the learner, teacher, content, peers, institution, and educational applications.
- Providing access and utility irrespective of time, geographical, or physical constraints.
- Enabling self-assessment through direct, optional online tests to measure learning progress.
- Solving real-life problems within the educational environment by leveraging online network resources.
- Granting learners independence and self-reliance in searching for required knowledge and information.
- Providing future-oriented information services built on networking with internal and external community members.
- Encouraging parents and local communities to engage and interact with the educational system (Mujahid, 2010).

II.3 Objectives of E-Learning

E-learning seeks to achieve several fundamental educational objectives:

- Creating an interactive educational environment through modern electronic technologies.
- Enhancing interaction between learners and instructors through exchanging educational experiences and discussions via communication channels such as email and chat (Al-Zayan, 2010).
- Equipping teachers with technical skills to utilize modern educational technologies.
- Establishing educational networks to organize and manage institutional workflows.
- Standardizing and modeling instruction to ensure uniform educational quality.
- Providing education suitable for diverse age groups while accommodating individual differences (Osman et al., 2015).

II.4 Models of E-Learning

E-learning is implemented in instruction through three primary models based on the degree of technology integration:

- **1. Blended Model:** Combines e-learning with traditional face-to-face classroom instruction. Computer- and Internet-based tools are utilized within physical classrooms. Specialists consider this model optimal as it merges the benefits of digital learning with classroom dynamics (Al-Omari, 2008).
- **2. Adjunct Model:** E-learning is partially employed to supplement traditional classroom teaching (e.g., using email, browsing websites prior to lectures, and using drill-and-practice software as auxiliary tools) (Mujahid, 2010).
- **3. Totally Online Model:** Relies fully on self-directed e-learning where the network serves as the primary medium for delivering the complete learning process—representing pure distance education via e-learning (Al-Othman, 2009).

Author's Insight: The choice of model depends on institutional capabilities and adopted policies. We recommend that educational institutions begin with blended learning and gradually transition toward a totally online model as technical and pedagogical competencies mature.

II.5 Requirements of E-Learning

While implementation requirements vary based on institutional goals, essential core components include:

A. Human Components

- **Instructors:** Qualified university professors capable of teaching using modern technologies, designing digital courses, and adapting teaching methods to learner characteristics.
- **Learners:** Learners possessing self-directed learning skills and digital literacy in computer applications and the Internet.

B. Physical and Technical Components

- Infrastructure, including servers, computers, and reliable high-speed Internet connectivity.
- Digital content and structured courses designed according to instructional design principles (text, graphics, interactive media).
- User interaction interfaces guiding learners through system components and navigation paths.
- Supporting Learning Management Systems (LMS) (Osman et al., 2015).

II.6 Advantages and Disadvantages of E-Learning

Advantages of E-Learning

- Providing supplementary course information and rich digital resources.
- Enhancing student academic achievement and test scores.
- Offering a flexible learning environment in terms of time and space (Moghazi, 2015).
- Increasing communication channels among students and between students and faculty via forums and email (Osman et al., 2015).
- Standardizing and modeling instructional delivery.
- Accommodating diverse learning styles and individual differences, assisting students who face focus or organization challenges.
- Diverse and rapid evaluation methods enabling automated feedback and assessment.
- Developing the teacher's role to keep pace with continuous technological advancements (QarQaji, 2014).

Disadvantages and Limitations of E-Learning

- **Sensory Restriction:** Over-reliance on visual and auditory senses while neglecting other sensory modalities (Al-Zayan, 2010).
- **Infrastructure Cost:** High initial costs for infrastructure, hardware, laboratories, and high-speed network lines.
- **Training Load:** Requirement for intensive training for faculty and students prior to implementation.
- **Reduced Human Interaction:** Lack of human presence and physical interpersonal relationships between teachers and learners.
- **Regulatory Ambiguity:** Ambiguity in operational regulations, policies, and incentive frameworks for e-learning environments.
- **Technical Bias:** Dominance of technical specialists over instructional design and pedagogical experts in system setup.
- **Security Concerns:** Concerns regarding data privacy, security, and potential breaches of exam content and personal records (Abdul-Raouf, 2015).

II.7 Obstacles and Challenges in E-Learning

Despite its benefits, key challenges hinder e-learning from fully achieving its intended goals (Abdul-Raouf, 2015):

- Incompatibility of traditional teaching methods with e-learning paradigms.
- Complexity and high effort required to produce digital educational content.
- Difficulty in providing individual computing devices for every learner.
- Inconsistent or unreliable Internet access.
- Rapid technological obsolescence and fast-paced ICT developments.
- High continuous maintenance and software licensing costs.
- Teacher attitudes and resistance toward technology adoption.
- Emergence of complex modern learning models.

Author's Synthesis: These challenges represent significant hurdles for educational practitioners. Technological acceleration requires qualified human resources, digital curriculum conversion, and robust infrastructure. Overcoming these barriers requires strong institutional willpower, strategic planning, strict academic integrity policies, learner awareness campaigns, and ongoing pedagogical/technical training for educators.

II.8 Roles of the Teacher and Learner in E-Learning

Role of the Teacher

In e-learning, the teacher transitions into multifaceted modern roles (Al-Tahir & Atiya, 2012): knowledge seeker, instructional designer, course developer, content provider, learning facilitator, technologist, information simplifier, student counselor, and evaluator. The educator acts as a pedagogical mediator and discussion leader across four primary areas: instructional design, technology integration, fostering student interaction, and promoting self-directed learning.

Role of the Learner

The learner assumes an active, central role. Rather than being a passive recipient of information, the learner becomes an active discoverer who explores concepts, engages in critical discussion, interacts with content and peers, and utilizes diverse online educational resources. This represents a qualitative shift from traditional rote memorization to active participation, critical thinking, knowledge creation, and advanced digital literacy (Taysir & Khantouli, 2016).

III. Quality in E-Learning

III.1 Concept of Quality in E-Learning

Quality in e-learning refers to 'a set of characteristics that accurately and comprehensively express the essence of the e-learning system across its various dimensions (inputs, processes, outputs, feedback) as a system striving to achieve effectiveness and efficiency in meeting global standards' (Al-Enezi & Khalaf-Allah, 2016).

III.2 Academic Importance of Quality in E-Learning

Quality is a strategic priority due to rapid scientific-technological advancement and heightened competition. Academic quality aims to enhance the final educational product by evaluating all components of the educational process against predefined standards (Al-Enezi & Khalaf-Allah, 2016). This aligns with two main axes:

- **1. Standard Compliance:** Conformance to Specifications
- **2. Market Alignment:** Meeting Market Requirements

In e-learning, quality requires continuous evaluation, monitoring, and quality control across all implementation stages to ensure strict compliance with standards.

III.3 Requirements for Quality in E-Learning

Core quality requirements in e-learning include (Ammar, 2015):

- Continuous evaluation and monitoring across all system stages.
- Robust instructor-to-learner support.
- Collaborative learning among students, experts, and teachers.
- High technical performance and system reliability.
- Cost-effectiveness.
- Transparency of course and institutional information.
- Pedagogical alignment and sound instructional principles.

III.4 Factors Affecting E-Learning Quality

Key factors influencing quality (Al-Enezi & Khalaf-Allah, 2016):

- **Pedagogical & Technical Factors:** Self-pacing, synchronous vs. asynchronous interaction tools, software adaptability, data privacy, user-friendliness, platform navigation, mobile responsiveness, reporting/analytics capabilities, and enrollment administration.
- **Student Factors:** Student commitment, curiosity, application, performance support, feedback responsiveness, and digital learning culture.

III.5 European and International E-Learning Quality Frameworks

Prominent international frameworks and standards models include (Ibrahim, 2016; Al-Enezi & Khalaf-Allah, 2016):

- European Foundation for Quality Management (EFQM)
- Open and Distance Learning (ODL) Quality Center
- European Association for Quality Assurance in Higher Education (ENQA)
- Aviation Industry Computer-Based Training Committee (AICC)
- IMS Global Learning Consortium
- Advanced Distributed Learning (ADL) / SCORM

- PROMETEUS Project
- ARIADNE Foundation (www.ariadne-eu.org)
- Centre for Educational Technology Interoperability Standards (CETIS)
- International Organization for Standardization (ISO)
- IEEE Learning Technology Standards Committee (LTSC)
- CEN/ISSS (European Committee for Standardization / Information Society Standardization System)
- Institute of IT Trainers (ITTT)

IV. Quality Standards in E-Learning

IV.1 Concept of Quality Standards in E-Learning

Quality standards are defined as 'a set of declared procedures and foundations upon which the e-learning system is built, aiming to ensure that the final educational output meets or exceeds system requirements' (Ammar, 2015). Ibrahim (2003) defined them as 'the set of specifications establishing requirements for quality systems in educational institutions, necessary for measuring actual final outcomes' (Al-Hafiz, 2014).

IV.2 Importance of Defining and Applying Quality Standards

Defining standards ensures alignment with global trends, guarantees educational product refinement, improves student outcomes, and enhances institutional competitiveness while reducing long-term costs (Hijazi & Saad, 2016). Applying these standards builds stakeholder confidence, protects students from low-quality programs, facilitates international student mobility, and enables academic accreditation (Al-Najdi, 2012).

IV.3 Conditions and Requirements for E-Learning Standards

Standards must account for e-learning/Internet environment characteristics, learner needs, socio-cultural context, technical/technological principles, and must remain current, precise, and scientifically grounded (Hijazi & Saad, 2016).

IV.4 Quality Controls and Standards in E-Learning

Key controls include integrating system design with institutional rules, reviewing academic standards regularly, aligning learning objectives with assessment modes, supporting self-directed learning, and employing valid, direct assessment mechanisms (Ahmed, 2017).

V. Proposed Vision for Quality Standards in E-Learning

V.1 Philosophy of the Proposed Vision

The proposed vision is founded on establishing a general framework for quality standards in e-learning to meet contemporary technological challenges and enhance instructional processes across all levels.

V.2 Foundations / Premises of the Proposed Vision

- Quality is the cornerstone of modern educational reform, requiring standardized performance indicators across all system elements.
- Building upon empirical findings and recommendations from prior literature regarding quality determinants.
- Aligning with global trends advocating e-learning adoption to achieve high performance, effectiveness, and community service.

V.3 Objectives of the Proposed Vision

The primary objective is to formulate a comprehensive list of quality standards for e-learning, branching into:

- Defining integrated design standards and indicators for e-learning systems.
- Ensuring academic and content quality in e-course design.
- Establishing supervisor support standards.
- Empowering self-directed learning and student autonomy.
- Setting administrative service quality benchmarks.
- Formulating robust summative assessment evaluation criteria.

Matrix of Proposed Quality Standards and Indicators

Standard Domain	Indicators of Achievement
1. Integrated E-Learning System Design	• Developing and managing academic programs while respecting e-learning specificities. • Complying with national regulatory laws and educational policies. • Allocating necessary financial budgets for e-learning infrastructure. • Designing and piloting instructional and administrative systems, ensuring quality compliance.
2. Content Quality & Electronic Course Design	• Ensuring seamless access to educational content. • Effective integration of multimedia elements. • Adaptability to institutional and learner needs. • Maintainability, updatability, and revision accessibility. • Alignment of content with learner characteristics and instructional strategies. • Clarity of scientific content and learning objectives.

Standard Domain	Indicators of Achievement
	• Availability of supplementary electronic learning resources. • Clear measurement and evaluation mechanisms. • Comprehensive course specifications (objectives, teaching methods, prerequisites). • Modular, logically sequenced content design. • Flexible navigation controls within the course. • Adherence to allocated course completion timelines. • Empowering learners to choose preferred learning pathways.
3. Supervisor Support & Guidance	• Providing continuous technical support and technology integration training. • Pedagogical support in instructional design principles. • Administrative support to streamline online learner interaction. • Familiarity with local and global digital educational resources. • Active integration of digital resources into teaching scenarios. • 24/7 engagement and interaction with students and administration. • Enthusiastic and engaging management of online learning environments.
4. Self-Learning & Learner Autonomy	• 24/7 technical support before and during enrollment. • Clear, comprehensive orientation on program requirements. • Explicit links between achievement, progress, and assessment. • Clear credit-hour tracking and academic progression systems. • Continuous updating of student guidance information. • Diverse communication channels for assignment submission. • Full access to digital libraries and academic e-books. • Administrative advisory services to resolve learner difficulties.

Standard Domain	Indicators of Achievement
	• Dedicated academic supervisors tracking study plans and advising course selection.
5. Quality of Administrative Services	• Continuous infrastructure development and service enhancement. • Explicit, published institutional goals and policies. • Effective supervision, periodic monitoring, and continuous system evaluation. • Rapid, accurate processing and display of student data. • High accuracy and integrity of academic records. • Robust data security, system privacy, and connection encryption. • High system reliability and fast processing response times.
6. Summative Assessment Methods	• Alignment of assessment tools with e-learning modes and learning outcomes. • Standardized, transparent grading procedures and prompt feedback. • Ensuring summative assessments accurately measure student achievement. • Direct institutional oversight during final examinations. • Systematic, periodic review and audit of evaluation practices.

VI. Conclusion and Recommendations

The quality of e-learning has become one of the most critical imperatives driven by rapid technological and informational advancements in recent years. Achieving effective educational outcomes requires concerted efforts from educational authorities, governments, and specialists to implement quality standards across infrastructure, self-directed learners, competent instructors, digitally designed curricula, and aligned assessment methods.

To achieve these objectives, the following recommendations are proposed:

- Educational and university institutions should adopt the proposed e-learning quality standards developed in this study by piloting implementation in selected university faculties and evaluating results.

- Establishing a national center dedicated to instilling e-learning principles and developing quality standards tailored to the national educational context.
- Conducting further empirical research regarding quality assurance applications in e-learning environments.
- Encouraging educational institutions to adopt e-learning by building robust physical and human infrastructure to ensure graduate quality and meet societal technological demands.

Declarations

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Data Availability: All materials are available in the cited sources.

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