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Research Article

Enhancing E-Learning Quality in Business Schools: Leveraging Communication Technologies in the Online Education Era

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ABSTRACT

Introduction: This study examines the influence of Quality Management Systems (QMS), such as ISO 9001 and EFQM, on e-learning environments in business and science schools.

Objectives: It highlights how combining QMS with modern e-learning standards, including SCORM, Learning Object Metadata (LOM), and tools like wikis and blogs, enhances the scalability, consistency, and compatibility of online learning systems.

Methods: The research applies a systematic review methodology (2020–2025) using a logical filtering framework.

Results: The findings show that implementing QMS frameworks leads to improved student satisfaction and better learning outcomes by supporting well-organized, accessible online platforms. The study also identifies challenges in faculty training and infrastructure, emphasizing the need for more in-depth research. These results underline the importance of QMS in transforming educational platforms to meet the needs of digital-native students and improving the overall quality of online education.

Conclusions: implementing Quality Management Systems (QMS) in e-learning is not just an operational task but a strategic priority for improving the overall quality of education.

Keywords: eLearning; Business Education; Quality Management Systems; SCORM;; Interoperability; Student Satisfaction; Digital Natives.

INTRODUCTION

E-learning has become a fundamental part of modern education, especially in business and science schools, where flexibility and accessibility are critical. Through the use of digital technologies, e-learning platforms

overcome traditional limitations, providing students with interactive and inclusive learning experiences. However, as these platforms grow, maintaining their quality and effectiveness presents significant challenges. The rapid expansion of e-learning calls for strong frameworks to uphold educational standards, improve user satisfaction, and enhance learning outcomes. Quality Management Systems (QMS), such as ISO 9001 and EFQM, have proven to be effective tools for addressing these issues. These systems offer structured approaches to standardize processes, ensure consistency, and support ongoing improvements in e-learning environments. By applying QMS principles, educational institutions can develop scalable platforms that cater to diverse learner needs while upholding high standards of quality and accountability. This study examines the connection between e-learning and quality management, focusing on how QMS frameworks improve student engagement, satisfaction, and performance. It also identifies the challenges in implementing these systems and the gaps that limit their effectiveness. Table 1 summarizes the reviewed studies, highlighting their contributions and areas where further progress is needed in e-learning quality management.

STUDY PROBLEM

The proliferation of e-learning platforms has intensified the need for quality assurance mechanisms. Without a robust framework, these platforms risk inconsistencies in content delivery, poor student engagement, and suboptimal educational outcomes. This study addresses the critical need for integrating QMS frameworks to standardize e-learning platforms in business and science schools, ensuring their effectiveness and sustainability.

STUDY OBJECTIVES

This research aims to achieve the following objectives:

1. Evaluate the influence of QMS frameworks, including ISO 9001 and EFQM, on e-learning quality.
2. Analyze how these frameworks enhance student satisfaction, engagement, and overall learning outcomes.
3. Identify challenges and gaps in the current application of QMS in e-learning environments.

STUDY QUESTIONS

The study sought to answer the following research questions:

1. How do implementing ISO 9001 and EFQM frameworks impact student outcomes in e-learning?
2. What factors drive student engagement and satisfaction when applying QMS frameworks?
3. What gaps exist in current QMS practices, and how can they be effectively addressed?

LITERATURE REVIEW

MEANING OF E-LEARNING:

The term e-learning or eLearning encompasses a concept that, on the whole, facilitates learning through computers. Over the years more and more new gadgets such as PDAs, and MP3 players have also come to be regarded as instruments of facilitating learning [1].

[2] proposed that the future may consist of paperless environments and/or hypermedia on the internet, multimedia optical devices, forums, groupware. Years later, [3] supposed that electronic mails, web-logs, wikis, instant messaging, computer-based testing, educational cartoons, virtual reality, videos games, course management systems, systems for voting and so forth, with possibly a combination of different methods being used will be developed to be more attractive. Along with the terms learning technology and Educational Technology, the term is generally used to refer to the use of technology in learning in a much broader sense than the computer-based training or (CBT-CAI-Learning)Computer Aided Instruction [4]. [5] concluded that CBT-learning broader than the terms Online Learning or Online Education which generally refer to purely

web-based learning. In situations where mobile technologies are utilized, the term mobile learning has become more common [6]. Distance education is a natural setting for e-learning and a flexible educational approach, however, the latter can also be implemented with conventional classroom teaching, in which case the term Blended learning is commonly used as it spiltted and distributed as E-learning, M-learning and D-learning [7].

[8] discussed the Online learning growth in both higher education and other areas, as well as that all relevant and necessary course components are integrated into one Virtual Learning Environment, which differs from a "Learning Management System" (LMS) as is sometimes integrated with a Managed Information System to make a Managed Learning Environment. they are presented to students from one specific and centralized perspective. There has been the advent of many physical universities, and even newer strictly virtual universities that have begun offering online programs and classes for various degrees on an array of subjects [9]. Some programs have certain residency requirements, that is, students need to be present on the campus for classes or orientation but the majority are offered as online courses only [10]. Also, there are some other electronic facilities found in a number of universities, such as online librarians, academic consultations, e-enrollment services, e- counseling services, student text book ordering website, e- student associations and e- newspapers [11].

This term can also apply to school websites, such as those that offer educational games, stories, scenarios, or worksheets for children. It is also commonly used in the corporate world. In this context, its meaning relates to non-expensive training [12], [13]and [14]

REASONS BEHIND CREATING E-LEARNING SYSTEM:

A substantial amount of research has been conducted to assess the effectiveness of online learning. However, when reviewing these studies, you'll notice that the conclusions often vary from one researcher to another. Despite these differing outcomes, there is a consensus that the design and structure of an online course play a crucial role in determining student success.[15]

E-LEARNING KEY ELEMENTS OF AN EFFECTIVE ONLINE COURSE:

- Just like in any learning environment, it's essential to understand your audience. [16]
- Design the course based on clearly defined learning objectives and goals, and make sure to communicate these clearly to learners.[17]
- Pay special attention to how online courses are presented. The goal isn't artistic design but rather creating an organized layout that allows for easy navigation and enhances learning. Graphics should support the content, and it's important to consider student skill levels and equipment limitations when incorporating audio, video, or web links [18].
- Foster a sense of community by encouraging interaction between students and instructors, promoting constructive feedback, maintaining motivation, and offering assessment tools with timely feedback.[19]
- Keep the learning environment adaptable. While individual needs, interests, and goals should be considered, they should not overshadow the main objectives. Knowledge should be updated in real-time and customized to align with educational goals.
- Ensure technical support is available to train and provide ongoing assistance to both students and instructors [20].
- Offer related links and resources to enhance and deepen the knowledge base.
- Regularly maintain online learning pages to ensure they remain relevant and up-to-date.

E-LEARNING ADVANTAGES & DISADVANTAGES

The advantages of e-learning often include its flexibility and convenience, particularly for learners with other commitments. It promotes easier communication between learners, allows greater adaptability to individual needs, and offers a more diverse learning experience through the use of multimedia and non-verbal teaching materials [21]. For instance, video instruction enables both visual and auditory learning and can be paused or replayed as needed. In organizations with dispersed or frequently changing teams, such as restaurant staff, e-learning present's significant benefits over traditional classroom training [22], [23]. However, some critics raise concerns about its application in education because critics of e-learning argue that the removal of face-to-face interaction with teachers diminishes the educational experience, claiming it no longer meets the highest philosophical standards of education, as defined by [24]. In addition, proponents of e-learning counter this criticism, asserting that meaningful human interaction can still be fostered through various digital tools, such as audio and video web-conferencing, discussion boards, live chats, blogs, wikis, and email, whether in real-time or asynchronously [25], [26]. In fact, many in the K-12 sector support e-learning, as long as it does not entirely eliminate the teacher-student relationship, which is central to guided learning[27], [28].

The sense of isolation commonly reported by distance learning students is frequently mentioned as a drawback [29]. However, discussion forums and other forms of computer-based communication can actually help mitigate this issue [30]. [31] found that e-Forum tools can even inspire students to meet in person and form self-help groups. Additionally, discussion groups can easily be organized online. Encouraging human interaction, whether between faculty and students or among students themselves, is essential in any format of learning [32].

The cost-effectiveness of e-learning remains a topic of debate, primarily due to the substantial initial investment it requires, which is typically offset through economies of scale. Developing e-learning platforms, including web and software systems, involves significant expenses, while the creation of adaptive learning materials demands considerably more time and resources compared to non-adaptive content. Consequently, these costs are often transferred to students, making online college courses generally more expensive than traditional, in-person program [33], [34].

GROWTH OF ELEARNING

Recently, the organization Independent Student Media has introduced a functional curriculum that educates students through an Interactive Online Textbook, providing a dynamic and engaging learning platform [35].

[36] reported that students participating in online learning at higher education institutions have significantly contributed to the rapid expansion of online education. Estimates suggest that between 2018 and 2026, the online learning industry is expected to grow at an annual rate of 9.1%. This substantial growth reflects the rising demand for digital education solutions as more individuals and institutions adopt online platforms due to their flexibility, accessibility, and scalability. Additionally, recent studies show that nearly all public higher education institutions, along with the majority of private, for-profit schools, now offer online courses, further driving the expansion of e-learning. In contrast, only about half of private, nonprofit institutions provide such options. According to surveys of academic leaders, students generally express satisfaction with their online classes, on par with traditional ones. As the cost of implementing online systems decreases, more private institutions may expand their involvement in online education [37]. However, these institutions must also employ properly trained staff who are not only experts in their subject areas but also proficient in using computers and the internet. [38] conceptualized the concept of the "digital native" that has gained traction, suggesting generational influences may shape the future of e-learning. As more adult learners embrace online education, the gap between traditional and online learning may narrow. Additionally, [38] found that e-learning leverages the flexibility and asynchronous capabilities of internet-based education.

E-LEARNING REUSABILITY, STANDARDS AND LEARNING OBJECTS

Significant effort has been invested in the technical reuse of digitally-based teaching materials, particularly in the development and reuse of Learning Objects. These are self-contained units of instruction, tagged with relevant keywords or other metadata, and often stored in an XML file format. When designing a course, these learning objects are assembled in a specific sequence to create a comprehensive learning experience [39].

There are both proprietary and open, non-commercial and commercial, peer-reviewed repositories of learning objects, such as the Eduwave repository provided by the Ministry of Education in Jordan. This repository is available for students and employees at all levels within the ministry, offering a valuable resource for accessing learning materials [40].

SCORM (Sharable Content Object Reference Model) is a widely used standard format for e-learning content, ensuring compatibility across various systems. Additional specifications, such as the Schools Interoperability Framework (SIF), facilitate the transfer of "learning objects," while Learning Object Metadata (LOM) serves to classify and organize these resources effectively [41].[42, 43]

These standards are still relatively new, with the oldest being approximately eight years old. They are also tailored to specific sectors: SIF is mainly designed for preK-12 education, LOM is predominantly utilized in corporate, military, and higher education settings, and SCORM is primarily applied in military and corporate environments, with limited adoption in higher education. Furthermore, the Post-Secondary Education Standards Council (PESC) is advancing efforts to develop standards and learning objects for higher education, while SIF is increasingly emphasizing instructional and curriculum-based learning resources [44]

In the US preK-12 sector, there are numerous content standards that play a vital role, with the NCES (National Center for Education Statistics) data standards being a key example. Each state government's content standards and achievement benchmarks serve as essential metadata for connecting e-learning objects within this educational space, ensuring alignment with specific educational goals and requirements [45].

E – LEARNING COMMUNICATION TECHNOLOGIES

Communication technologies are typically divided into two categories: asynchronous and synchronous. Asynchronous activities involve tools like blogs, wikis, and discussion boards, where participants can engage at different times. In contrast, synchronous activities require all participants to be involved simultaneously, as seen in chat sessions, virtual classrooms, or online meetings.

The term "eLearning 2.0" refers to the use of social software tools like blogs and wikis in educational contexts. This approach has been notably promoted by Stephen Downes, who manages a widely popular daily blog and newsletter, advocating for the integration of these collaborative tools into e-learning environments [46].

GLOSSARY

- **SCORM:** (Sharable Content Object Reference Model) is a collection of technical standards designed for e-learning software. It ensures that various learning management systems (LMS) can consistently share, reuse, and manage educational content. SCORM facilitates the seamless transfer of online courses across platforms, ensures compatibility, and tracks learners' progress through the material. In essence, it promotes interoperability between e-learning systems and their content.
- **LOM:** Learning Object Metadata is a standard for describing digital learning resources. It provides a structured way to categorize and organize learning objects by assigning metadata such as title, author, subject, format, and other relevant details. This makes it easier to search, locate, and reuse learning materials across various platforms and educational environments. LOM is primarily used in corporate, military, and higher education sectors to facilitate effective e-learning content management.

- **PLATO:** (Programmed Logic for Automatic Teaching Operations) is one of the earliest computer-based education systems, originally developed in the 1960s at the University of Illinois. It was designed to provide interactive, computer-assisted instruction across a variety of subjects. PLATO featured innovations such as online forums, message boards, chat rooms, and multimedia learning tools, making it a pioneering platform for e-learning.
- **Blogs:** Blogs, short for "weblogs," are online platforms where individuals or groups can regularly post written content, often in a diary-like or article format. In an educational context, blogs are used as tools for reflection, knowledge sharing, and discussion. They allow learners to express ideas, engage in critical thinking, and receive feedback from peers and instructors. Blogs are an example of asynchronous communication in e-learning, where participants can interact at different times by commenting and responding to posts. Most blogs are primarily textual although some focus on photographs (photoblog), sketchblog, videos (vlog), or audio (podcasting), and are part of a wider network of social media.[47]
- **Wiki:** is a collaborative online platform that allows multiple users to create, edit, and share content collectively. In education, wikis are often used as tools for group work, enabling students to collaborate on projects, share knowledge, and build a repository of information. Wikis are dynamic, meaning the content can be continuously updated or revised by the users. They support asynchronous learning by allowing participants to contribute at their own pace, making them valuable for collaborative learning environments.
- **ELearning 2.0:** refers to the integration of Web 2.0 technologies, such as social media tools, blogs, wikis, and other collaborative platforms, into the learning process. This approach emphasizes user-generated content, social interaction, and collaboration, moving beyond traditional, instructor-led learning models. eLearning 2.0 encourages learners to actively participate in the creation and sharing of knowledge, fostering a more interactive and community-driven educational experience. It focuses on the idea that learning is not just about content consumption but also about engagement, collaboration, and communication among learners.
- **Digital natives:** are generally defined as individuals born after 1980 who have had widespread access to digital media throughout their lives. Growing up during the rise of digital technology, they have become familiar with computers, the internet, smartphones, and other devices from an early age. Coined by Marc Prensky, the term refers to individuals who are naturally skilled at using digital tools and navigating online environments due to their early exposure. Unlike previous generations who had to adapt to these technologies, digital natives often prefer interactive and technology-based approaches to learning and communication.

METHODOLOGY

This study uses a systematic review approach to examine peer-reviewed articles published between 2020 and 2025, focusing on the application of Quality Management Systems (QMS) in e-learning environments. The research was carried out using databases such as Google Scholar, JSTOR, and ScienceDirect, using keywords like 'Quality Management in E-Learning,' 'ISO 9001 in Higher Education,' and 'EFQM in Business Schools.' The filtering process involved narrowing results by date range, area of study, and a specific focus on e-learning platforms in business and science schools.

THE STUDY SUGGESTED MODEL OF ELEARNING SYSTEMATIC REVIEW

The methodology used the following model to implement the systematic review approach. The model visually represents how each parameter (QMS, Time, Keywords, Area of Study) points to the total relevant studies (R)See figure 1:

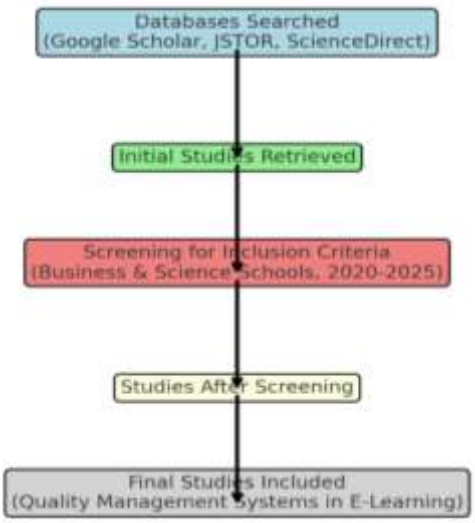

Figure 1. Systematic Review Formula Implementation (QMS, Time, Keywords, Area of Study)

SYSTEMATIC REVIEW FORMULA

The systematic review process is governed by the following parameters:

Let:
QMS = (ISO 9001, EFQM) and ***T*** = (2020 ≤ year ≤ 2025) and ***A*** = (Business Schools, Science Schools) and ***K*** = (Keywords: 'E-learning', 'QMS', 'ISO 9001', 'EFQM') and ***R*** = Total Relevant Studies. The number of relevant studies (R) is obtained by applying logical AND conditions on keywords (K), time frame (T), and area of study (A) such that:

$$R = QMS \quad AND \quad T \quad AND \quad A \quad AND \quad K$$

R = Total Relevant Studies

The number of relevant studies (R) is obtained by applying logical AND conditions on keywords (K), time frame (T), and area of study (A) such that:

$$R = QMS\ AND\ T\ AND\ A\ AND\ K$$

Mathematically, this can be represented as:

$$R = QMS \cap T \cap A \cap K$$

FORMULA IMPLEMENTATION RESULTS

The analyzed studies show that Quality Management System (QMS) frameworks, such as ISO 9001 and EFQM, play a significant role in enhancing the quality of e-learning environments. They improve content delivery, increase student satisfaction, and promote more effective interactions between faculty and students. Nevertheless, several challenges were noted, such as the need for stronger technical infrastructure and more comprehensive data regarding long-term student outcomes. The table below provides an overview of the studies included in the systematic review and highlights key gaps identified in the research.

RESULTS

The review highlights the critical role of Quality Management System (QMS) frameworks, such as ISO 9001 and EFQM, in shaping e-learning environments. These frameworks improve content delivery, increase

student satisfaction, and enhance interactions between faculty and students. Table 1 summarizes the key studies, showcasing their contributions and pointing out areas requiring further investigation.

COMPREHENSIVE COMPILATION: QUALITY MANAGEMENT IN E-LEARNING

Table 1. Resulted references

	Title	Relation to Topic	Database Citation: ProQuest
1	Quality Assurance Drives Continuous Improvements to Online Programs	Focuses on the need for robust quality assurance mechanisms to enhance online education.	[48].
2	Building a High-Quality Ed.D. Program on a Foundation of Research-Based Best Practices for Online Course Design	Highlights the importance of faculty training and standards adherence in online course quality.	[49]
3	Ensuring Online Quality Teaching through Initial Teachers' Training and Support	Emphasizes the necessity of teacher training for ensuring quality in online education.	[50]
4	Applying Cognitive Science to Online Teaching and Learning Strategies	Discusses cognitive principles that enhance online teaching and learning effectiveness.	[51]
5	Creating a Supportive Culture for Online, Remote, and Hyflex Teaching	Stresses the importance of institutional support for quality in online education.	[51]
6	Transfer of Training: Adult Education and Workplace Learning	Focuses on the importance of knowledge transfer in adult education and its relevance to e-learning.	[52]
7	Quality Assurance in an Era of Sudden Online Education	Focuses on the need for robust quality assurance mechanisms to enhance online education.	[53]
8	Fundamentals of Educational Technology: Blended Learning	Discusses blended learning models and their benefits.	[54]
9	A Guide to Administering Distance Learning	Outlines challenges and strategies in online education.	[55]

ANALYSIS OF QUALITY ASSURANCE DRIVES CONTINUOUS IMPROVEMENTS TO ONLINE PROGRAMS

This document addresses the challenges that higher education institutions face in maintaining quality in the design and delivery of online programs, emphasizing the importance of strong quality assurance mechanisms to foster continuous improvement in online education. The University of North Florida (UNF) is used as a case study, showcasing the implementation of a customizable quality assurance framework. The chapter outlines strategies for fostering collaboration among program stakeholders, developing quality plans, and creating policies to support ongoing enhancements. The insights presented align with quality management principles in e-learning, as effective frameworks, like the one at UNF, ensure not only the effective design of online programs but also their continuous assessment and improvement. This approach is crucial for enhancing student satisfaction and success, which are central to quality management in higher education.

ANALYSIS OF BUILDING A HIGH-QUALITY ED.D. PROGRAM ON A FOUNDATION OF RESEARCH-BASED BEST PRACTICES FOR ONLINE COURSE DESIGN

This section outlines an initiative by a Doctor of Education (Ed.D.) program aimed at improving the quality of its online courses. The effort included faculty training, resource provision, and obtaining external certification for the program's courses. The successful implementation of these strategies resulted in enhanced student experiences and increased recognition for the program. The chapter stresses the importance of using Quality Matters as a key standard for ensuring high-quality course design. These

initiatives highlight the critical role of faculty training and adherence to best practices in course design as central to quality management in e-learning. The emphasis on certification and standards contributes to improving teaching quality and student outcomes, which are essential for maintaining high standards in online education.

ANALYSIS OF ENSURING ONLINE QUALITY TEACHING THROUGH INITIAL TEACHERS' TRAINING AND SUPPORT

This study highlights the crucial role of initial training for online educators in ensuring quality teaching within online education programs. It describes the form-tic training program at the Open University of Catalonia (UOC), designed to equip new online teachers with the essential skills and competencies for effective online instruction. Evidence presented in the chapter demonstrates the program's success in improving teaching quality and student satisfaction. The emphasis on teacher training and support is vital for quality management in e-learning, as providing educators with the necessary tools for online instruction is key to delivering high-quality learning experiences. This approach aligns with broader quality management practices focused on enhancing instructional effectiveness and improving student outcomes in online education programs

ANALYSIS OF APPLYING COGNITIVE SCIENCE TO ONLINE TEACHING AND LEARNING STRATEGIES

The document outlines a set of principles from cognitive science research that are fundamental for improving teaching and learning in online environments. The authors stress the importance of course design, student engagement, and instructional strategies in boosting learning outcomes. Key principles include sequencing learning tasks in the order they will be performed, utilizing active learning techniques, and incorporating multimedia to aid comprehension. The document argues that technology's real potential is not in enhancing traditional methods but in creating new, unique learning experiences that would otherwise be impossible. These findings highlight the importance of robust pedagogical strategies in quality management for e-learning. Applying these cognitive principles enables educators to enhance course quality and boost student satisfaction, which are essential indicators of successful online learning programs.

ANALYSIS OF CREATING A SUPPORTIVE CULTURE FOR ONLINE, REMOTE, AND HYFLEX TEACHING

This document highlights the critical need for institutional support and fostering a positive culture for online teaching. It explores the essential roles of faculty development, instructor training, and a robust technological infrastructure as key foundations for creating effective online courses. The chapter argues that high-quality professional development and ongoing support significantly enhance faculty satisfaction and student outcomes. It also addresses the challenges instructors face when transitioning to online formats, particularly following the rapid changes brought by the COVID-19 pandemic. The document reinforces the importance of faculty development and institutional support in maintaining quality management in online education. A supportive environment not only improves teaching effectiveness but also boosts student retention and satisfaction, both of which are crucial elements of quality management systems in education.

ANALYSIS OF TRANSFER OF TRAINING: ADULT EDUCATION AND WORKPLACE LEARNING

The document explores the challenges of transferring training in adult education, emphasizing the effectiveness of applying acquired skills in workplace contexts. It defines the concepts of learning and training transfer, noting that the success of training programs depends on factors such as program design, learner characteristics, and workplace conditions. The findings indicate that the transition of training to actual job performance is often limited, highlighting the need to understand learner motivation and organizational factors to improve these outcomes. The document emphasizes that educational programs must not only

deliver content effectively but also equip learners to apply their knowledge in practical, real-world scenarios. This emphasis on skill transferability is particularly relevant to quality management in e-learning, where achieving meaningful and practical outcomes for students and organizations is a key goal.

ANALYSIS OF QUALITY ASSURANCE IN AN ERA OF SUDDEN ONLINE EDUCATION

The document focuses on quality assurance processes in e-learning, particularly in response to the rapid shift to online education during lockdowns. It emphasizes the vital role of effective quality management systems in maintaining educational standards throughout this transition. Key aspects include the importance of continuous feedback mechanisms, the role of technology in enhancing student engagement, and the need for faculty training to adapt to online teaching. The findings highlight that student satisfaction, closely tied to the perceived value and benefits of e-learning systems, reinforces the necessity for strong quality management in online education.

ANALYSIS OF FUNDAMENTALS OF EDUCATIONAL TECHNOLOGY: BLENDED LEARNING

This document explores blended learning as a hybrid model that integrates traditional face-to-face instruction with online learning components. It highlights several advantages, including improved accessibility, flexible learning pace, and increased student engagement through interactions with peers and instructors. Additionally, it addresses challenges, such as the need for robust Learning Management Systems (LMS) tailored to specific educational requirements. The document emphasizes that when implemented thoughtfully, blended learning can effectively personalize education and enhance learning outcomes.

ANALYSIS OF A GUIDE TO ADMINISTERING DISTANCE LEARNING

This document outlines the various barriers encountered in online education and offers strategies to address them. It identifies key challenges, including interpersonal, technological, pedagogical, and institutional obstacles, which impact both students and faculty in the online learning setting. By addressing these barriers, institutions can improve the overall effectiveness and accessibility of online education for all participants.

- Barriers in Online Education: The document identifies key challenges in online courses, such as limited interaction between students and faculty, technological anxiety, and the need for students to self-regulate. Faculty may also struggle with feelings of isolation and diminished motivation due to the lack of direct student engagement.
- Strategies for Overcoming Barriers: The document suggests that administrators develop strategic plans for online learning, provide faculty with adequate resources and training, and ensure robust technological support. For instructors, it highlights the importance of professional development and the use of interactive course designs to engage students.
- Accreditation and Quality Assurance: The document stresses the need for institutions to align their policies with accreditation standards to uphold the quality of online education. Regular policy reviews and compliance with federal regulations are essential for maintaining educational integrity.
- Ethics and Integrity: It also emphasizes the importance of upholding ethical standards in distance education, focusing on academic integrity and verifying student identity in online assessments.

OVERALL CONNECTION TO QUALITY MANAGEMENT IN E-LEARNING

The insights from these documents complement one another, underscoring the critical need for continuous improvement, effective communication, and addressing barriers to enhance learning outcomes. The strategies for overcoming challenges align closely with quality assurance principles, emphasizing the importance of faculty training, robust technological support, and fostering a supportive learning environment for both students and instructors. Additionally, the focus on accreditation and adherence to ethical standards strengthens the argument for rigorous quality management in e-learning, ensuring the integrity and effectiveness of online education programs.

DISCUSSION

- **Quality assurance drives continuous improvements to online programs:** This document underscores the importance of robust quality assurance systems in enhancing online programs, directly answering study questions about how quality assurance impacts student satisfaction and retention. Structured quality management practices ensure institutions uphold educational standards while responding to student feedback, fostering a culture of continuous improvement. My perspective is that such systems are essential for maintaining high-quality learning experiences.
- **Building a High-Quality Ed.D. Program on a Foundation of Research-Based Best Practices for Online Course Design:** This document highlights the need for faculty training and adherence to best practices in course design, directly addressing teaching effectiveness in online programs. Investing in research-based practices and faculty development ensures instructors are well-equipped, which contributes significantly to the quality of online education. I believe that well-prepared faculty are key to delivering high-quality online learning experiences.
- **Ensuring Online Quality Teaching through Initial Teachers' Training and Support:** The necessity of teacher training connects directly with study questions about instructional quality. Without proper training, online instructors may struggle to engage students effectively, impacting learning outcomes. Comprehensive training programs are essential to equip educators with the tools needed to support and engage students, justifying the need for institutions to prioritize teacher development.
- **Applying Cognitive Science to Online Teaching and Learning Strategies:** This document addresses study questions related to enhancing student engagement through the application of cognitive principles in instructional design. Gaining a deeper understanding of how students learn can result in more effective engagement and teaching strategies. Incorporating cognitive science into course design improves learning outcomes, increases accessibility, and makes the content more engaging for students.
- **Creating a Supportive Culture for Online, Remote, and Hyflex Teaching:** Addressing study questions on institutional policies, this document emphasizes the role of institutional support in maintaining high-quality online education. A supportive culture improves faculty morale and student engagement, which is crucial for sustaining quality. I believe such a culture empowers educators and fosters collaboration, leading to better educational experiences.
- **Transfer of Training: Adult Education and Workplace Learning:** This reference highlights the importance of applying acquired skills in real-world settings, addressing study questions related to the practical implementation of knowledge. Enabling this transfer is crucial for enhancing student satisfaction and ensuring career readiness. Designing educational programs that align with industry demands increases their relevance and effectiveness, equipping students with the necessary skills for professional success.
- **Quality Assurance in an Era of Sudden Online Education:** This document addresses maintaining educational standards during sudden transitions to online education, such as during the pandemic. It emphasizes the importance of adaptability in quality management practices, answering study questions about maintaining standards in challenging circumstances. I believe that institutions that adapt quickly to such transitions are better positioned to support student success.
- **Fundamentals of Educational Technology: Blended Learning:** This document discusses the benefits of blended learning, answering study questions related to effective teaching methods. Blended learning, which combines face-to-face and online instruction, offers flexibility that caters to diverse student needs. From my perspective, investing in blended learning strategies enhances educational effectiveness and improves student satisfaction.
- **A Guide to Administering Distance Learning:** This document outlines challenges and strategies in online education, aligning with study questions focused on barriers to learning.

Identifying and addressing barriers like technological anxiety is crucial for improving the online learning experience. I believe that targeted interventions to overcome these challenges can significantly enhance student outcomes in online education.

These insights collectively reinforce the need for quality assurance, faculty development, and the application of best practices in online education to drive continuous improvement and enhance student outcomes.

CONCLUSION

Quality management in e-learning is a critical aspect that ensures educational programs are effective, relevant, and aligned with industry standards. As e-learning has become increasingly prevalent, particularly during the COVID-19 pandemic, it has exposed the need for robust quality assurance frameworks. These frameworks should focus on the continuous improvement of teaching methodologies, technological integration, and learner engagement. Effective quality management not only enhances the learning experience but also fosters student satisfaction and retention. Furthermore, it promotes faculty development by equipping instructors to effectively handle the challenges of online teaching. Emphasizing the importance of feedback mechanisms and accreditation standards allows institutions to build a dynamic learning environment that caters to the needs of diverse learners. In summary, implementing Quality Management Systems (QMS) in e-learning is not just an operational task but a strategic priority for improving the overall quality of education. This study highlights the critical role of accreditation standards and feedback systems in creating a supportive and engaging learning environment. The findings suggest that educational institutions should focus on integrating quality management practices to address current educational needs and prepare for future challenges in e-learning. By closing existing gaps and continuously refining their approaches, institutions can significantly improve student satisfaction, engagement, and overall learning outcomes.

REFERENCES

[1] Traxler J, Kukulska-Hulme A. Mobile Learning : A Handbook for Educators and Trainers. Oxford, UNITED KINGDOM: Taylor & Francis Group; 2005.
[2] Graf C, Hartmann K, Billinghurst M. Digital Characters in the Real World. 2004.
[3] Kamel Boulos MN, Wheeler S. The emerging Web 2.0 social software: an enabling suite of sociable technologies in health and health care education 1. Health Information & Libraries Journal. 2007;24(1):2-23.
[4] Winters FI, Greene JA, Costich CM. Self-regulation of learning within computer-based learning environments: A critical analysis. Educational psychology review. 2008;20:429-44.
[5] Siemens G, Gašević D, Dawson S. Preparing for the digital university: A review of the history and current state of distance, blended and online learning. 2015.
[6] Sung Y-T, Chang K-E, Liu T-C. The effects of integrating mobile devices with teaching and learning on students' learning performance: A meta-analysis and research synthesis. Computers & Education. 2016;94:252-75.
[7] Kumar Basak S, Wotto M, Bélanger P. E-learning, M-learning and D-learning: Conceptual definition and comparative analysis. E-learning and Digital Media. 2018;15(4):191-216.
[8] Oliveira PCd, Cunha CJCdA, Nakayama MK. Learning Management Systems (LMS) and e-learning management: an integrative review and research agenda. JISTEM-Journal of Information Systems and Technology Management. 2016;13(2):157-80.
[9] Simonson M, Zvacek SM, Smaldino S. Teaching and learning at a distance: Foundations of distance education 7th edition. 2019.
[10] Xu D, Xu Y. The ambivalence about distance learning in higher education: Challenges, opportunities, and policy implications. Higher Education: Handbook of Theory and Research: Volume 35. 2020:351-401.
[11] Aleshire DO. Beyond profession: The next future of theological education. 2021.
[12] Gönen MS, Sahin MK, Ezmeci F, Selçuklu AE. A Review of Preschool Manipulative Storybooks Containing Activities. International Journal of Progressive Education. 2018;14(3):60-75.

[13] Angafor GN, Yevseyeva I, He Y. Game-based learning: A review of tabletop exercises for cybersecurity incident response training. Security and privacy. 2020;3(6):e126.
[14] Makri A, Vlachopoulos D, Martina RA. Digital escape rooms as innovative pedagogical tools in education: A systematic literature review. Sustainability. 2021;13(8):4587.
[15] Means B, Toyama Y, Murphy R, Baki M. The effectiveness of online and blended learning: A meta-analysis of the empirical literature. Teachers college record. 2013;115(3):1-47.
[16] Bentley JP, Tinney MV, Chia BH. Intercultural Internet-based learning: Know your audience and what it values. Educational technology research and development. 2005:117-27.
[17] Hmelo-Silver CE. Problem-based learning: What and how do students learn? Educational psychology review. 2004;16:235-66.
[18] Hamdi M, Hamtini TM. Designing an effective e-content development framework for the enhancement of learning programming. International Journal of Emerging Technologies in Learning (Online). 2016;11(4):131.
[19] Evans C. Making sense of assessment feedback in higher education. Review of educational research. 2013;83(1):70-120.
[20] Hew KF, Cheung WS. Students' and instructors' use of massive open online courses (MOOCs): Motivations and challenges. Educational research review. 2014;12:45-58.
[21] Chowdhury D. Role of e-learning on education: A review of literature. Asian Journal of Management. 2019;10(3):273-8.
[22] Sablić M, Mirosavljević A, Škugor A. Video-based learning (VBL)—past, present and future: An overview of the research published from 2008 to 2019. Technology, Knowledge and Learning. 2021;26(4):1061-77.
[23] Delungahawatta T, Dunne SS, Hyde S, Halpenny L, McGrath D, O'Regan A, et al. Advances in e-learning in undergraduate clinical medicine: a systematic review. BMC Medical Education. 2022;22(1):711.
[24] Abualadas HM, Xu L. Achievement of learning outcomes in non-traditional (online) versus traditional (face-to-face) anatomy teaching in medical schools: A mixed method systematic review. Clinical Anatomy. 2023;36(1):50-76.
[25] Dianati S, Schubert M. Synchronous and asynchronous academic support for online students: A review of three technological tools. Journal of Academic Language and Learning. 2018;12(1):267-85.
[26] Naidu S, Laxman K. Factors inhibiting teachers' embracing elearning in secondary education: A literature review. Asian Journal of Distance Education. 2019;14(2):124-43.
[27] Shohel MMC, Ashrafuzzaman M, Azim F, Naomee I, Rahman MS, Siddik MAB. Blended learning space for primary and secondary education: Challenges and opportunities in resource-constrained contexts. Designing effective distance and blended learning environments in K-12. 2022:187-222.
[28] Johnson CC, Walton JB, Strickler L, Elliott JB. Online teaching in K-12 education in the United States: A systematic review. Review of Educational Research. 2023;93(3):353-411.
[29] Sharpe R, Benfield G. The student experience of e-learning in higher education. Brookes eJournal of Learning and Teaching. 2005;1(3):1-9.
[30] Trelease RB. From chalkboard, slides, and paper to e-learning: How computing technologies have transformed anatomical sciences education. Anatomical sciences education. 2016;9(6):583-602.
[31] Seale J. Doing student voice work in higher education: An exploration of the value of participatory methods. British Educational Research Journal. 2009;36(6):995-1015.
[32] Vovides Y, Sanchez-Alonso S, Mitropoulou V, Nickmans G. The use of e-learning course management systems to support learning strategies and to improve self-regulated learning. Educational Research Review. 2007;2(1):64-74.
[33] Edwards P, Felix L, Harris J, Ferguson E, Free C, Landon J, et al. Assessing the effectiveness and cost effectiveness of adaptive e-Learning to improve dietary behaviour: Protocol for a systematic review. BMC Public Health. 2010;10:1-8.
[34] Gwala N, Dlungwane TP, Nkambule S, Mashamba-Thompson T. Cost and Cost-effectiveness of eLearning Interventions for Healthcare Workers in Low-and Middle-income Countries: a Protocol for a Systematic Review and Meta-analysis. 2021.
[35] Bell BS, Federman JE. E-learning in postsecondary education. The future of children. 2013:165-85.
[36] Peck D. Online learning statistics: The ultimate list in 2024. Devlin Peck. 2024.
[37] Xu T, Xue L. Satisfaction with online education among students, faculty, and parents before and after the COVID-19 outbreak: Evidence from a meta-analysis. Frontiers in psychology. 2023;14:1128034.
[38] Reid L, Button D, Brommeyer M. Challenging the Myth of the Digital Native: A Narrative. 2023.

[39] Kamil W. Identification of the Perceptive and Motor Skills in Elderly People when Designing a Human-Computer Interaction. Ergonomics For People With Disabilities: Sciendo; 2018. p. 163-74.
[40] Abu-Shanab E, Ababneh N, Momani A. E-LEARNING SYSTEMS' ACCEPTANCE: THE CASE OF EDUWAVE IN JORDAN. Bucharest: "Carol I" National Defence University; 2012. p. 463-7.
[41] Veiga IDdC. Location-Aware in M-Learning Applications [M.E.]. Portugal: Universidade da Beira Interior (Portugal); 2009.
[42] Waters JK. SIF 3.0: TECHNOLOGICAL HORIZONS IN EDUCATION. THE Journal. 2009;36(7):27.
[43] Αριστείδου MX, Maria A. Social Tagging Evaluation Methodologies in Technology - Enhanced Learning [Master's]. Greece: University of Piraeus (Greece); 2012.
[44] Alasmari T. Reshaping vocational training: a study on the recognition of micro-credentials in job markets. Education & Training. 2024;66(2/3):233-51.
[45] Report C. JORDAN: COUNTRY REVIEW. Country Report. CountryWatch Incorporated; 2024. Report No.: 15202054.
[46] Alkhataba EHA, Abdul-Hamid S, Bashir I. Technology-Supported Online Writing: An Overview of Six Major Web 2.0 Tools for Collaborative-Online Writing. Arab World English Journal. 2018;9(1):433-46.
[47] Deepa N, T D. Prediction Of Short Text In Weblogs For Accurate Classification Using Iohe A Machine Learning Technique. Turkish Journal of Physiotherapy Rehabilitation. 2021;32(2):1320-3.
[48] Hulen K. Quality assurance drives continuous improvements to online programs. Quality in online programs: Approaches and practices in higher education. 2022:3-22.
[49] Gillham JC, Williams NV. Building a High-Quality Ed. D. Program on a Foundation of Research-Based Best Practices for Online Course Design. Quality in Online Programs: Brill; 2022. p. 100-15.
[50] Sangrà A, Guitert M, Romeu T. Ensuring Online Quality Teaching through Initial Teachers' Training and Support. Quality in Online Programs. 2022:173-92.
[51] Nilson LB, Goodson LA. Online Teaching at Its Best : Merging Instructional Design with Teaching and Learning Research. Newark, UNITED STATES: John Wiley & Sons, Incorporated; 2021.
[52] Daffron SR, Caffarella RS, Cervero RM. Planning Programs for Adult Learners : A Practical Guide. Newark, UNITED STATES: John Wiley & Sons, Incorporated; 2021.
[53] Dalrymple J, Chatterji M. Quality Assurance in an Era of Sudden on-Line Education. Bradford, West Yorkshire, UNITED KINGDOM: Emerald Publishing Limited; 2021.
[54] Shareef SM, Nithyanantham V. Fundamentals of Educational Technology. Singapore, SINGAPORE: Bentham Science Publishers; 2022.
[55] Lauren C. A Guide to Administering Distance Learning. Leiden: Brill; 2021.