

Received: December 2023 Accepted: January 2024

DOI: <https://doi.org/10.58262/ks.v12i2.157>

# Existing Quality Assurance Frameworks for Online Learning Platforms

Hussin Ahmad Hamzah<sup>1</sup>, Muhamad Sadry Abu Seman<sup>2</sup>

## Abstract

*With the outbreak of COVID-19 came an increase in online learning platforms as educational institutions moved towards e-Learning; quality assurance became paramount. This paper seeks to review and compare existing quality assurance frameworks for online learning platforms across three regions - United Kingdom, Malaysia, and Middle Eastern nations - before offering recommendations to enhance e-learning quality in higher education environments. An expert panel conducted a systematic review examining and comparing various quality assurance frameworks to assess online learning platforms. The review focuses on frameworks such as Quality Matters (QM), Online Learning Consortium (OLC), and the European Association for Quality Assurance in Higher Education (ENQA) Framework for Quality Assurance in E-learning (E-excellence). The review reveals the diverse scope and focus of the quality assurance frameworks, highlighting their differences and similarities. It identifies each framework's standards and guidelines for evaluating content quality, accessibility, usability, and pedagogy. Effective quality assurance frameworks depend on their implementation and adoption by educational institutions. This paper concludes by offering recommendations to enhance e-learning quality in higher education based on insights gleaned by reviewing existing frameworks in the UK, Malaysia, and Middle Eastern nations.*

**Keywords:** Quality Assurance Framework, Online Learning platforms, and e-learning quality frameworks.

## 1. Introduction

The rapid rise of online learning platforms as a prevalent mode of education delivery has been fueled by the digital age and the COVID-19 pandemic [1]. However, ensuring the quality of these platforms is a critical concern for educational institutions and students [1]. Various quality assurance frameworks have been developed to address this concern to ensure that online learning platforms meet the required standards. These frameworks provide standards, guidelines, and best practices for designing, delivering, and evaluating online courses to deliver compelling, engaging, and accessible learning experiences. Quality Matters (QM) is one of the oldest and most well-known quality assurance frameworks, established in 2003 as a non-profit organisation dedicated to developing online learning standards [2]. QM includes eight general standards covering course design, learner support, and assessment, with specific course evaluation criteria.

The Online Learning Consortium (OLC) Quality Scorecard is another prominent framework, featuring ten categories encompassing course design, technology, and assessment [3]. Newer frameworks are emerging to meet evolving needs. The Online Learning Consortium's Quality

---

<sup>1</sup> International Islamic University Malaysia. Email: [hussin.hamzah@live.iium.edu.my](mailto:hussin.hamzah@live.iium.edu.my)

<sup>2</sup> International Islamic University Malaysia. Email: [msadri@iium.edu.my](mailto:msadri@iium.edu.my)

Scorecard 2.0 incorporates categories reflecting changing aspects of online Learning, such as accessibility, mobile Learning, and analytics [4]. It evaluates course quality based on emerging trends, emphasising indicators like accessibility and alignment with industry standards.

The Digital Learning Quality (DLQ) framework, developed by the European Commission's Joint Research Centre, covers 12 dimensions of digital Learning [5]. It offers adaptability and guidance for designing high-quality digital learning experiences.

These quality assurance frameworks ensure high-quality education through online learning platforms [6]. They provide evaluation criteria and guidelines for assessing platform quality. As online learning progresses, new frameworks may appear to meet learners' and institutions' evolving needs.

## 2. Literature Review

### • Addressing Digital Divide Issues

The digital divide refers to disparities in technology access and utilization between individuals and communities. Researchers have investigated various strategies to bridge this divide. [7] emphasizes the importance of inclusive policies and interventions to address the 21st-century digital divide. analyze the digital divide in education, shedding light on the role of socioeconomic factors and the significance of equitable technology integration in schools. Efforts to narrow the divide require comprehensive approaches prioritizing equal access, affordability, digital literacy, and targeted interventions, ensuring that technology is accessible and beneficial for all individuals and communities.

### • Online Learning Platforms

Online learning platforms have gained significant attention in recent years as flexible and accessible tools for education. In the study by [8], the authors compare the levels of accessibility among learning management system (LMS) platforms supporting online learning systems. Their research provides valuable insights for individuals and institutions in selecting suitable platforms for their specific needs. Another study by [9] examines and compares various free e-learning platforms. This research sheds light on these platforms' features, functionalities, and differences. [10]conducts a comparative analysis of two e-learning platforms in the context of language learning in an English classroom setting. The study investigates the impact of these platforms on prior-year students' language learning outcomes. The findings provide valuable information for educators and institutions seeking practical language learning tools. Online learning platforms encompass a variety of formats, including massive open online courses (MOOCs), learning management systems (LMS), and virtual classrooms. These platforms offer numerous advantages, such as flexibility in scheduling, self-paced Learning, and access to a wide range of educational resources. However, challenges and concerns exist regarding online content quality, learner support services and developing necessary digital skills for learners. Addressing such concerns effectively is crucial to ensure online learning platforms' effectiveness and success.

### • Quality Assurance Frameworks

Quality assurance frameworks play a crucial role in ensuring the effectiveness and reliability of educational systems. In the study by [11] a comprehensive literature review explores total quality management (TQM) models, frameworks, and tools and techniques in higher education. This

research provides insights into the different approaches and strategies employed to enhance quality assurance in this sector. In the context of Chinese private higher education, [12] conducted a multi-dimensional analysis and proposed a quality and quality assurance framework. Their study examines factors that impact quality, including teaching, research, infrastructure, and governance, while suggesting measures to improve quality assurance practices. During the COVID-19 pandemic, ensuring online learning quality control has become crucial. [13] investigate online learning quality control in Indonesia during the pandemic. Their study focuses on the challenges of maintaining quality standards and proposes strategies and recommendations for effective quality control in nonformal education settings. Quality assurance frameworks provide guidance and standards for educational institutions to maintain and enhance the quality of their programs and services. These frameworks encompass various aspects such as curriculum design, teaching methodologies, assessment practices, student support, and infrastructure. Implementing robust quality assurance frameworks is essential for fostering continuous improvement and ensuring the delivery of high-quality education.

### **3. Materials and Methods**

- **Introduction**

As part of this review, a systematic method was applied in order to analyze and assess existing quality assurance frameworks for online learning platforms. The primary focus was frameworks used in the United Kingdom, Malaysia, and Middle Eastern countries.

- **The Review**

A comprehensive search was conducted in scholarly databases, including research articles, conference proceedings, and relevant publications. Keywords such as "online learning platforms," "quality assurance frameworks," and "e-learning quality" were used to identify relevant studies. The selected papers were critically reviewed to extract information on the quality assurance frameworks' scope, criteria, and effectiveness. The comparison was performed based on each framework's standards and guidelines concerning content quality, accessibility, usability and pedagogy. This review provided insights that enabled recommendations for improving e-learning quality within higher education institutions. The limitations of this review include the exclusion of frameworks from other regions and a potential language bias due to the English language search terms. Nonetheless, this review provides valuable insights into online learning platforms' existing quality assurance frameworks and their implications for enhancing e-learning quality.

### **4. Challenges and Opportunities in E-Learning Adoption in Embracing Innovative Technologies**

The fast reception of e-learning platforms and the integration of creative advancements in training present the two difficulties and potentially open doors for instructive organizations. Understanding and tending to these difficulties is pivotal for fruitful execution and augmenting the advantages of e-learning. This part discusses vital difficulties and potentially open doors related to e-learning reception in embracing imaginative advancements. One of the essential difficulties in e-learning reception is the advanced separation. The openness and accessibility of innovation and web networks fluctuate across various locales and financial foundations. Numerous students, especially those from burdened networks, may need admittance to the

essential gadgets and solid web associations, upsetting their support in Online Learning [1]. Crossing over the advanced gap requires proactive endeavours from foundations and policymakers to give equivalent admittance to innovation and web assets; it is abandoned to guarantee no student.

Another test is the requirement for effective academic systems in e-learning. Standard showing techniques may not interpret well to online conditions, expecting teachers to adjust their informative ways of drawing in and persuading students [14]. E-learning stages offer open doors for intelligent and customized growth opportunities through highlights like sight and sound assets, computer experiences, and online cooperation devices. As it may, instructors should go through the proficient turn of events, prepare to use these apparatuses and configure instructively sound internet-based courses.

Quality assurance and accreditation processes present extra difficulties in e-learning reception. As e-learning keeps advancing, guaranteeing the quality and validity of online courses and projects becomes progressively significant [6]. Authorizing bodies and instructive foundations need to foster robust systems to survey and perceive the nature of online schooling, including the assessment configuration, content, evaluation strategies, and student support administrations [12]. As examined prior, laying out far-reaching quality confirmation systems is crucial in this test.

Also, student commitment and inspiration can be critical test in e-learning conditions. Without eye-to-eye association, students might feel secluded and fall short of close associations and backing commonly tracked down in regular homerooms. Foundations ought to effectively advance student commitment through different methodologies, like cultivating on the web networks, working with joint peer effort, and giving intuitive learning exercises. Gamification and versatile learning advancements can likewise upgrade student inspiration by integrating components of contests, remunerates, and customized growth opportunities.

## **5. Review and Comparison of E-Learning Quality Frameworks in the Middle Eastern Countries, Malaysia, and the United Kingdom**

### **• Overview**

Several quality structures for e-learning have been developed and implemented in different countries, such as the Middle Eastern countries, Malaysia, and the United Kingdom [1, 6, 15]. These frameworks aim to ensure the delivery of high-quality education through online platforms.

### **• Cultural Considerations in E-Learning Frameworks**

Cultural considerations significantly impact the effectiveness of e-learning frameworks, playing a vital role in their design and implementation. These considerations play a direct role in instructional design, content delivery and learner support of an e-learning framework - tailoring its design specifically to target learners' cultural preferences and context. By acknowledging and incorporating cultural factors such as language usage patterns or communication styles within educational systems, e-learning frameworks can enhance learners' engagement while increasing inclusivity and knowledge transference effectively. Taking cultural considerations into account allows for developing more contextually relevant and culturally sensitive e-learning experiences, ultimately improving learner satisfaction and success.

- **Middle Eastern Countries: E-Learning**

The e-learning landscape in Middle Eastern countries showcases the development and implementation of various e-learning quality frameworks. These frameworks aim to ensure high-quality education via online platforms. Qatar recently implemented their National E-Learning Framework (QNeLF), offering a centralized approach that emphasizes technology integration, pedagogy, curriculum design and assessments for online education. [1]. This comprehensive framework adheres to international standards but is specific to Qatar.

In the United Arab Emirates (UAE), the e-Learning Standards framework has been established to guarantee quality e-learning programs. It encompasses design, development, evaluation, and implementation. This practical framework is aligned with international standards and ensures the effectiveness of e-learning in the UAE context.

Saudi Arabia has its own e-Learning Quality Assurance Standards (SE-QAS) framework, encompassing content and instructional design, delivery, evaluation and assessment, and learner support. This comprehensive framework covers all essential areas of e-learning and meets international standards, although it is specific to Saudi Arabia.

Similarly, Oman has developed the e-Learning Quality Assurance Framework, focusing on content and instructional strategy, delivery and technology, evaluation and assessment, and learner support. This framework ensures the quality of e-learning programs in Oman and aligns with international standards, covering all crucial aspects of e-learning. These e-learning quality frameworks in Middle Eastern countries highlight their commitment to delivering high-quality online education. While they share similarities in addressing content, delivery, evaluation, and support, each framework's contextual specifications may not be applicable across all Middle Eastern countries.

- **E-Learning Quality Frameworks in Malaysia**

In Malaysia, significant efforts have been made to establish and implement various e-learning quality frameworks. These frameworks play a crucial role in ensuring the effectiveness and quality of online learning experiences. One notable framework is the Malaysian e-Learning Quality Standard (MyQUESTI), which evaluates the quality of e-learning in higher education institutions. MyQUESTI assesses multiple areas, including curriculum and Learning, teaching, and Learning processes, student support services, institutional support, and infrastructure [6]. By providing a comprehensive evaluation, MyQUESTI encourages continuous improvement of e-learning systems in higher education institutions.

The Malaysian Qualification Framework (MQF) is another essential framework that guarantees the quality of e-learning qualifications across all levels of education in Malaysia. It is a common reference point for ensuring high-quality qualifications and learning outcomes. MQF promotes standardization and quality assurance in e-learning, both at the national and international levels, enhancing the recognition and credibility of Malaysian qualifications.

The Multimedia Development Corporation (MDeC) Framework for E-Learning focuses on promoting effectiveness and quality in e-learning courses. This framework provides practical course design, assessment, delivery, and learner support guidelines. By emphasizing the use of technology and considering various facets of e-learning, the MDeC Framework aims to enhance the overall learning experience and facilitate the integration of innovative instructional practices. The E-Learning Quality Assurance Framework developed by Malaysia's Ministry of Education ensures quality and effectiveness in online education throughout Malaysia's primary and secondary schools (Ali, Raza, Qazi Puaah & Education 2018). This comprehensive framework covers course design, delivery, assessment and learner support services.

- **The United Kingdom's Approach to E-Learning Quality**

United Kingdom institutions have made considerable strides to develop effective e-learning quality frameworks to guarantee high standards and meet learners' needs. Two prominent frameworks include Quality Assurance Agency for Higher Education's (QAA) E-learning Quality Code and Joint Information Systems Committee's (JISC) E-Learning Framework. The QAA e-learning quality code is vital in guiding the design, delivery, and assessment of e-learning courses in higher education. It covers various aspects, including developing learning outcomes, course materials, technology utilization, and assessment methods [15]. By providing clear guidelines and standards, this framework helps institutions ensure that their e-learning courses meet high-quality standards and provide a positive learning experience for students.

Similarly, the JISC E-Learning Framework offers a set of standards and guidelines for developing and implementing e-learning courses. It emphasizes learner-centred pedagogy, effective technology integration, and meaningful learning assessment. This framework aims to improve the quality of e-learning courses and ensure they meet the diverse needs of learners.

One of the strengths of these frameworks is their flexibility. Institutions can adapt the frameworks as a whole or selectively based on their specific requirements. This tailored approach allows institutions to focus on the elements most relevant to their needs, ensuring the effective implementation of e-learning quality practices.

While the UK frameworks have been widely recognized for their comprehensive coverage and impact on e-learning course design, delivery, and assessment, some experts argue that additional measures may be necessary for consistent quality assurance and accreditation of e-learning programs. They suggest the need for more standardized approaches to ensure consistent quality across all e-learning offerings in the UK.

The table below shows the e-learning quality framework in the Middle Eastern, Malaysia, and UK with their description, goals, sample, and location method used in the study and references.

**Table 1:** E-Learning Quality Framework in the Middle Eastern.

Description	Goals	Sample and location	Method	Reference
Quality assurance for e-learning courses	To review quality assurance frameworks for e-learning courses To identify gaps and challenges in current quality assurance practices To provide recommendations for improving quality assurance in online Learning	University e-learning programs in the Middle East	Systematic literature review	[16]
Learning from successful online students: 20 Guidelines	To examine factors that contribute to the success of online students. To examine the perceptions of e-learning quality assurance in higher education institutions in the Middle East	Online students in the Middle East	Qualitative study	[17]
Quality assurance in online education: Insights from a qualitative study of current practice	To explore quality assurance practices in Online Learning	Higher education institutions offering online courses in the Middle East	Qualitative study	[18]
Online quality assurance in higher education: A review and recommendations	To provide recommendations for online quality assurance in higher education	Online Learning in higher education in the Middle East	Literature review	[19]
Quality assurance in online education: A comparative analysis	To compare quality assurance in online education in different countries in the Middle East To identify factors that affect the effectiveness of quality assurance	Online education programs in Malaysia, Japan, and Singapore	Comparative analysis	[20]



**Table 2:** E-Learning Quality Framework in the Malaysia.

Description	Goals	Sample and location	Method	Reference
Development of a quality assurance framework for Online Learning in higher education	To develop a quality assurance framework for Online Learning in higher education	Higher education institutions were offering online courses in Malaysia.	Delphi study	[21]
Guidelines for quality assurance in cross-border higher education (online and blended provision)	To explore the use of digital tools and platforms for quality assurance in vocational education and training To identify gaps and challenges in current quality assurance practices To provide recommendations for improving quality assurance	Vocational Education and training providers in Malaysia	Literature review	[22]
Quality assurance in VET: The role of digital tools and platforms	To provide guidelines for quality assurance in cross-border higher education (online and blended provision)	Cross-border higher education providers in Malaysia and Europe	Expert consultation	[23]
Developing a quality assurance framework for online distance learning	To develop a quality assurance framework for online distance learning	Higher education institutions offering online distance learning in the UK and Malaysia	Case study	[24]

**Table 3:** E-Learning Quality Framework in the UK.

Description	Goals	Sample and location	Method	Reference
Online quality assurance in higher education: A review and recommendations	To provide recommendations for online quality assurance in higher education	Online Learning in higher education in the UK	Literature review	[19]
Developing a quality assurance framework for online distance learning	To develop a quality assurance framework for online distance learning	Higher education institutions offering online distance learning in the UK and Malaysia	Case study	[24]
Quality assurance in VET: The role of digital tools and platforms	To provide guidelines for quality assurance in cross-border higher education (online and blended provision)	Cross-border higher education providers in the UK and Europe	Expert consultation	[23]

## 6. Recommendations to Improve the Quality of E-Learning, Especially in Higher Education

Several recommendations can be made based on the analysis of existing frameworks to improve the quality assurance of online Learning. Firstly, institutions should establish clear and measurable quality standards aligned with their overall goals and involve all stakeholders in their development. This includes faculty members, administrators, students, and quality assurance experts [25]. Secondly, regular monitoring and evaluation of online courses and programs should be conducted using quality assurance tools such as rubrics, peer reviews, and automated assessments [26]. Thirdly, providing faculty members with adequate training and support to develop and deliver high-quality online courses is essential.

In terms of course design, institutions should invest in engaging, interactive, and relevant e-learning courses that cater to diverse learning styles. Incorporating multimedia elements like images, videos, and interactive simulations enhances the learning experience [14]. Clear instructions, learning objectives, manageable modules or units, and regular assessments help gauge learners' progress. Providing feedback and opportunities for interaction with instructors and peers through discussion forums, online chats, and video conferencing fosters community and improves learning outcomes.

The quality of learning resources is crucial, and institutions should develop high-quality, accessible, and up-to-date resources. Access to online libraries, research databases, and relevant academic resources should be provided [26]. Continuous quality improvement involves regular evaluation through surveys, focus groups, and feedback mechanisms. Monitoring learners' performance and using the data to enhance course design and delivery is essential. Institutions should ensure compliance with industry standards and relevant accrediting bodies to provide students with a quality education.

## **7. Best Practices for Enhancing E-Learning Quality**

With digitization driving higher education forward, e-learning has become an essential element. However, to ensure its effectiveness and success, quality experiences must be provided for e-learners. Institutions around the globe have implemented various quality assurance frameworks and best practices to accomplish their objective of quality improvement, to reach this objective. Recent years have witnessed an exponential surge in the adoption of e-learning for higher education due to technological innovations and rising student interest in flexible remote learning methods that offer more accessibility and convenience for their studies. Since there has been such an increased focus on quality standards for online learning systems and courses, academic research into their implementation has seen an exponential surge. Institutions have also developed quality frameworks containing best practices standardized across institutions for improved performance by setting goals like curriculum development; faculty support; student services, and evaluation assessment and accreditation processes [27]. Such quality frameworks promote the use of ICT for teaching purposes by setting international standards such as those set by QM or institutes like MeLQ that apply across Middle Eastern nations.

De Battista also identified inclusive rubrics incorporating several approaches in this field that could assist evaluators in assessing digital courses' effectiveness. He identified models to assist evaluation boards in determining which aspects are essential when judging digital course effectiveness. These models aim to foster student-centric effective Learning via proper design, easy navigation, and multimedia content delivery as critical factors essential to widening acceptance beyond traditional physical classroom environments among higher education learners worldwide. Quality frameworks and best practices developed specifically to evaluate content quality evaluation, accessibility evaluation, and usability evaluation, as well as their implementation by educational institutions, determine their success or failure when applied correctly by those working within a theme.

## **8. The Future of E-Learning Quality Frameworks and Continuous Improvement Strategies**

With the increasing adoption of e-learning, developing, and implementing quality frameworks and continuous improvement strategies are integral to providing students with high-quality



learning experiences. These strategies must address the digital divide, effective pedagogical practices, student engagement and motivation, and robust quality assurance procedures. Educational institutions should incorporate cultural considerations when creating and implementing e-learning frameworks to ensure they align with learners' cultural circumstances and preferences. Prioritizing these areas can enable educational institutions to promote inclusive and sustainable environments that support high-quality e-learning experiences for their learners. Future E-learning Quality Frameworks and Continuous Improvement Strategies Will Emphasize Customized Learning Experiences through cutting-edge technologies like Artificial Intelligence (AI) and Virtual Reality (VR). Institutions will leverage such technologies to target learners' unique learning needs while offering immersive and compelling experiences tailored to all learners [28].

While current quality assurance frameworks for online learning platforms provide essential standards and guidelines for evaluating content quality, their proper implementation requires a practical application to guarantee effectiveness. Thus, future e-learning quality frameworks may involve addressing challenges like the digital divide, student engagement strategies and emerging technologies to provide personalized learning experiences - prioritizations of these areas by educational institutions can increase e-learning quality while creating inclusive growth environments tailored towards Higher Education students in today's digital era.

## **9. Promoting Inclusive, E-Learning Sustainable Growth Environments**

Promote inclusive and sustainable learning environments online to ensure all students can access high-quality education. Educational institutions must bridge the digital divide by giving all students equal access to technology, internet connectivity and relevant software applications. Addressing challenges such as the digital divide, effective pedagogical practices, student engagement and motivation, and quality assurance mechanisms is integral. Educational institutions must incorporate cultural considerations when developing and implementing online learning frameworks to ensure they correspond to learners' cultural environments and preferences. Prioritizing these areas will allow institutions to design online learning environments tailored to the unique needs of their students, encouraging inclusive and sustainable growth. Emerging technologies like Artificial Intelligence and Virtual Reality may also provide tailored learning experiences that are engaging and effective, further boosting e-learning quality overall. Institutions should prioritize creating inclusive and sustainable growth environments through targeted efforts and investments such as effective quality assurance processes, adopting emerging technologies and training educators.

## **10. Conclusion**

In conclusion, reviewing existing quality assurance frameworks for online learning platforms in the United Kingdom, Malaysia, and Middle Eastern countries reveals these frameworks' diverse scope and focus. Frameworks such as Quality Matters, Online Learning Consortium Quality Scorecard, and European Association for Quality Assurance in Higher Education Framework for Quality Assurance in E-learning provide standards and guidelines for evaluating content quality, accessibility, usability, and pedagogy. However, the effectiveness of these frameworks relies on their implementation and adoption by educational institutions. To enhance e-learning quality in higher education, addressing the challenges and capitalizing on the opportunities presented by e-learning adoption is crucial. Challenges include the digital

divide, effective pedagogical strategies, quality assurance, student engagement and motivation. Overcoming these challenges requires equal access to technology, training for educators, robust quality assurance processes, and strategies to promote student engagement.

Cultural considerations are significant in designing and implementing e-learning frameworks, ensuring they align with learners' cultural context and preferences. Middle Eastern nations have developed several e-learning quality frameworks, such as Qatar's National E-learning Framework and UAE's E-Learning Standards Framework; Saudi Arabia offers Quality Assurance Standards, while Oman offers its e-Learning Quality Assurance Frameworks. These frameworks emphasize content, delivery, evaluation, and support while addressing contextual specifications. In Malaysia, frameworks like MyQUEST and the Malaysian Qualification Framework (MQF) focus on evaluating and ensuring the quality of e-learning in higher education institutions. These frameworks promote continuous improvement, standardization, and quality assurance at the national and international levels.

To enhance e-learning quality, educational institutions should consider implementing robust quality assurance frameworks, addressing the digital divide, providing practical pedagogical training for educators, and fostering student engagement and motivation through various strategies. By addressing these recommendations and building upon existing frameworks, higher education institutions can ensure the delivery of high-quality e-learning experiences.

## Acknowledgements

Our success in producing this paper could not have been possible without the valuable support of numerous individuals, who read my multiple revisions carefully, helping eliminate any remaining ambiguities and enhance text clarity. A special thanks to University IIUM College for The Kulliyah of Information and Communication Technology (KICT), for providing me with invaluable knowledge that was instrumental to its completion successfully.

## References

- [1] S. Al-Salman, A. S. Haider, H. J. T. J. o. M. H. T. Saed, *Education, and Practice*, "The psychological impact of COVID-19's e-learning digital tools on Jordanian university students' well-being," 2022.
- [2] D. B. Tannehill, C. P. Serapiglia, and J. J. I. S. E. J. Guiler, "Administrative or faculty control of online course development and teaching: A comparison of three institutions," vol. 16, no. 3, p. 26, 2018.
- [3] A. Akimov, M. J. A. Malin, and E. i. H. Education, "When old becomes new: a case study of oral examination as an online assessment tool," vol. 45, no. 8, pp. 1205-1221, 2020.
- [4] M. J. J. o. D. S. R. Barbour, "Looking back to see ahead: An analysis of K-12 distance, online, and remote learning during the pandemic," vol. 4, no. 2, pp. 7-25, 2022.
- [5] F. Quinn *et al.*, "Developing, situating and evaluating effective online professional learning and development: A review of some theoretical and policy frameworks," vol. 46, pp. 405-424, 2019.
- [6] S. Farid, R. Ahmad, M. Alam, A. Akbar, V. J. I. D. Chang, and Delivery, "A sustainable quality assessment model for the information delivery in E-learning systems," vol. 46, no. 1, pp. 1-25, 2018.
- [7] M. Warschauer, M. Knobel, and L. J. E. p. Stone, "Technology and equity in schooling: Deconstructing the digital divide," vol. 18, no. 4, pp. 562-588, 2004.

- [8] T. Acosta and S. Luján-Mora, "Comparison from the levels of accessibility on LMS platforms that supports the online learning system," in *EDULEARN16 Proceedings*, 2016, pp. 2704-2711: IATED.
- [9] M. Ouadoud, M. Y. Chkouri, A. Nejari, and K. E. El Kadiri, "Studying and comparing the free e-learning platforms," in *2016 4th IEEE International Colloquium on Information Science and Technology (CiSt)*, 2016, pp. 581-586: IEEE.
- [10] S. J. C.-E. Al-Mubirek, "E-learning in the English classroom: Comparing two e-learning platforms impacting preparatory year students' language learning," vol. 20, no. 2, pp. 19-37, 2019.
- [11] N. V. K. Jasti, V. Venkateswaran, S. Kota, and K. S. J. T. T. J. Sangwan, "A literature review on total quality management (models, frameworks, and tools and techniques) in higher education," vol. 34, no. 5, pp. 1298-1319, 2022.
- [12] Y. Cao and X. J. Q. A. i. E. Li, "Quality and quality assurance in Chinese private higher education: A multi-dimensional analysis and a proposed framework," 2014.
- [13] M. Giatman, S. Siswati, and I. Y. J. J. o. N. E. Basri, "Online learning quality control in the pandemic Covid-19 era in Indonesia," vol. 6, no. 2, pp. 168-175, 2020.
- [14] K. Hadullo, R. Oboko, E. J. I. j. o. E. Omwenga, and D. u. ICT, "Factors affecting asynchronous e-learning quality in developing countries university settings," vol. 14, no. 1, 2018.
- [15] N. Chipere, "A framework for developing sustainable e-learning programmes," *The Journal of Open, Distance*, vol. 32, no. 1, pp. 36-55, 2017.
- [16] S. A. Anwar, M. S. Sohail, and M. J. Q. A. i. E. Al-Marri, "Quality assurance dimensions for e-learning institutions in Gulf countries," vol. 28, no. 4, pp. 205-217, 2020.
- [17] A. O. Mohammed, B. A. Khidhir, A. Nazeer, and V. J. J. I. I. S. Vijayan, "Emergency remote teaching during Coronavirus pandemic: the current trend and future directive at Middle East College Oman," vol. 5, pp. 1-11, 2020.
- [18] H. van den Berg, R. Velayudhan, and R. S. J. P. n. t. d. Yadav, "Management of insecticides for use in disease vector control: Lessons from six countries in Asia and the Middle East," vol. 15, no. 4, p. e0009358, 2021.
- [19] B. Alzahrani, H. Bahaitham, M. Andejany, and A. J. S. Elshennawy, "How ready is higher education for quality 4.0 transformation according to the LNS research framework?," vol. 13, no. 9, p. 5169, 2021.
- [20] M. A. Mohamed Hashim, I. Tlemsani, R. J. E. Matthews, and I. Technologies, "Higher education strategy in digital transformation," pp. 1-25, 2021.
- [21] R. Mustapha, M. F. Jafar, M. M. Othman, M. K. Jusoh, and N. S. J. I. J. A. R. B. S. S. Ibrahim, "The development of i-cylearn framework in online digital learning in higher education: The fuzzy delphi method study," vol. 11, pp. 412-428, 2021.
- [22] N. R. D. M. B. Varghese, "Globalization and cross-border mobility in higher education," *Educational Access and Excellence*, vol. 1, no. 9, 2018.
- [23] A. N. A. Razak, M. K. Noordin, M. F. A. J. J. o. T. E. Khanan, and Training, "Digital Learning in Technical and Vocational Education and Training (TVET) In Public University, Malaysia," vol. 14, no. 3, pp. 49-59, 2022.
- [24] S. D. A. Bujang, A. Selamat, O. Krejcar, P. Maresova, and N. T. Nguyen, "Digital learning demand for future education 4.0—Case studies at Malaysia education institutions," in *Informatics*, 2020, vol. 7, no. 2, p. 13: MDPI.
- [25] F. Martin, S. J. L. Kumar, and m. e.-l. W. t. e.-l. l. n. t. know, "Frameworks for assessing and evaluating e-learning courses and programs," pp. 271-280, 2018.
- [26] M. Ali, S. A. Raza, W. Qazi, C.-H. J. I. T. Puah, and S. Education, "Assessing e-learning system in higher education institutes: Evidence from structural equation modelling," 2018.

- [27] D. A. Asegu, M. J. J. o. E. Tafere, and Research, "The Abandoned Agenda: The Issue of Quality in Private Distance Education Colleges in Mertulemariam Town," vol. 12, no. 1, pp. 33-56, 2022.
- [28] X. Yang and L. J. S. P. Tan, "The Construction of Accurate Recommendation Model of Learning Resources of Knowledge Graph under Deep Learning," vol. 2022, 2022.