

Promoting and enabling higher education through open and distance learning: Towards a national policy and effective implementation of e-learning in Libya

A Scoping review

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Abstract:

E-learning and distance education have increasingly become essential components of higher education in Libya. The Libyan Ministry of Higher Education and Scientific Research has initiated efforts to rebuild the national education system and promote the integration of e-learning across universities. This scoping review synthesizes published research from 2000 to 2024, focusing on the effectiveness of e-learning, implementation strategies, challenges, and recommendations for improvement. The review analyzes studies that explore student attitudes, barriers to adoption, e-learning models, and the adoption of learning management systems (LMS). Libyan higher education institutions must address technology-related decisions before implementing e-learning strategies. Beyond questions concerning the type and quantity of hardware and software required, institutions must also consider how to support new technologies effectively. It is essential for universities to determine how to utilize technology as an effective educational tool aligned with their specific learning contexts and to transform current teaching and learning methods in accordance with e-learning models. Findings indicate that while e-learning enhances accessibility and flexibility, challenges such as infrastructure limitations, faculty resistance, and policy gaps must be addressed to ensure successful implementation. Therefore, there is an urgent need to conduct further studies on e-learning in Libyan universities to expand knowledge, bridge existing gaps, and propose well-defined programs and implementation plans.

Keywords: E-Learning, Libya, Higher Education, Distance Education, Scoping Review.

المستخلص:

أصبح التعلم الإلكتروني والتعليم عن بُعد بشكل متزايد من المكونات الأساسية للتعليم العالي في ليبيا. بدأت وزارة التعليم العالي والبحث العلمي الليبية جهودًا لإعادة بناء نظام التعليم الوطني وتعزيز دمج التعلم الإلكتروني في الجامعات. يلخص هذا الاستعراض النطاقي الأبحاث المنشورة خلال الفترة من 2000 إلى 2024م، مع التركيز على فعالية التعلم الإلكتروني، واستراتيجيات التنفيذ، والتحديات، والتوصيات اللازمة للتحسين. يحلل الاستعراض الدراسات التي تستكشف اتجاهات الطلاب، والحوجز التي تحول دون التبني، ونماذج التعلم الإلكتروني، وتبني أنظمة إدارة التعلم (LMS). يتعين على مؤسسات التعليم العالي الليبية معالجة القرارات المتعلقة بالتكنولوجيا قبل تنفيذ استراتيجيات التعلم الإلكتروني. فإلى جانب التساؤلات حول نوع وكمية الأجهزة والبرامج المطلوبة، يجب على المؤسسات أيضًا التفكير في كيفية دعم التكنولوجيا الجديدة بفعالية. من الضروري أن تحدد الجامعات كيفية توظيف التكنولوجيا كأداة تعليمية فعالة تتناسب مع سياقاتها التعليمية الخاصة، وتغيير أساليب التدريس والتعلم الحالية وفقًا لنماذج التعلم الإلكتروني. تشير النتائج إلى أنه على الرغم من أن التعلم الإلكتروني يعزز إمكانية الوصول والمرونة، إلا أن التحديات مثل قيود البنية التحتية، ومقاومة أعضاء هيئة التدريس، والفجوات في السياسات يجب معالجتها لضمان التنفيذ الناجح. لذلك، هناك حاجة ملحة لإجراء المزيد من الدراسات حول التعلم الإلكتروني في الجامعات الليبية لتوسيع المعرفة، وسد الفجوات القائمة، واقتراح برامج وخطط تنفيذية محددة المعالم.

الكلمات المفتاحية: التعلم الإلكتروني، ليبيا، التعليم العالي، التعليم عن بعد، مراجعة نطاقية.

1. Introduction

The integration of e-learning and distance learning in higher education has been a growing trend globally. In Libya, the necessity of digital education has become more pronounced due to factors such as increasing student populations, technological advancements, and the COVID-19 pandemic [1]. However, challenges such as limited internet access, lack of digital literacy, and institutional resistance have hindered widespread adoption [2].

E-learning offers numerous benefits, including enhanced accessibility for students in remote areas, flexibility for learners with varied commitments, and cost-effectiveness in delivering educational content [3]. In the Middle East and North Africa (MENA) region, the adoption of e-learning has varied considerably due to economic, technological, and social factors. While some countries have built robust digital infrastructures to support online learning, others, including Libya, continue to face significant challenges [4]. Historically, higher education in Libya has relied heavily on traditional, classroom-based instruction. However, the growing availability of digital technologies has opened up new opportunities for learning. Several government initiatives have sought to modernize educational practices by integrating information and communication technology (ICT) into higher education institutions [5]. Despite these efforts, issues such as inadequate funding, insufficient training for educators, and resistance to changing established practices have limited progress [6].

The COVID-19 pandemic further accelerated the need for digital education solutions, exposing significant gaps in Libya's preparedness for e-learning. During lockdowns, many universities attempted a rapid transition to online platforms; however, the move was hampered by unreliable internet access, limited digital competencies among both faculty and students, and the absence of structured online curricula [7]. These challenges underscore the need for a comprehensive, well-supported strategy to implement e-learning effectively in Libya.

2. Research Significance

The importance of e-learning and distance education in higher education is growing globally, particularly in Libya, where the traditional education system faces numerous challenges. This scoping review holds significant value as it provides a comprehensive synthesis and analysis of the published literature on e-learning in Libya over the past two decades (2000–2024). It addresses a critical knowledge gap, as no previous studies have offered a holistic framework for evaluating the current state of e-learning in Libya while drawing comparisons with regional and international experiences. Furthermore, this study offers practical recommendations for policymakers and stakeholders within the Libyan Ministry of Higher Education and universities, thereby contributing to the development of an effective national strategy for e-learning implementation. The timeliness of this research is particularly notable, given the growing need for flexible educational solutions amidst the economic and social challenges facing Libya. In this context, e-learning emerges as a strategic option to ensure the continuity and quality of higher education.

3. Research Gap in effective implementation of e-learning in Libya

While several studies have examined e-learning adoption in the MENA region, there is a lack of comprehensive, longitudinal research focused specifically on Libya. Existing studies primarily highlight individual barriers (e.g., internet infrastructure, faculty training) but do not provide an overarching framework for sustainable implementation. Additionally, while many nations have successfully integrated mobile learning, artificial intelligence (AI)-driven education, and gamification into their systems, research on how Libya can leverage these technologies remains limited. This review fills the gap by synthesizing two decades of research (2000–2024) on e-learning in Libyan higher education, analyzing key challenges, implementation strategies, and international comparisons. Unlike previous studies that focus on isolated factors, this review provides a holistic analysis incorporating student attitudes, policy gaps, and technological adoption. Furthermore, by comparing Libya's progress with successful global initiatives, this study offers practical recommendations for policymakers and educators.

4. Research Questions

To address these gaps, this literature review seeks to answer the following key questions:

1. What are the primary challenges hindering the adoption of e-learning in Libyan higher education?

2. How have Libyan universities attempted to implement e-learning, and what factors have influenced success or failure?
3. What are students' and faculty members' perceptions of e-learning, and how do these attitudes impact adoption?
4. How does Libya's e-learning landscape compare with successful implementations in other MENA and international contexts?
5. What policy recommendations and implementation strategies can improve the effectiveness of e-learning in Libya?

5. Methodology

This scoping review follows a systematic approach to ensure a comprehensive and unbiased analysis of e-learning and distance learning in Libyan higher education from 2000 to 2024. Search strategies were developed and implemented in reliable academic databases relevant to the field of information technology and education, including: IEEE Xplore, Scopus, Google Scholar, ResearchGate, and ERIC (Education Resources Information Center). These databases were selected to ensure coverage of both technological and educational aspects of e-learning. Data was collected from articles published from 2000 to 2024. The methodology includes a structured literature search, clear inclusion/exclusion criteria, and risk-of-bias assessment to ensure the reliability of finding.

6. Inclusion and Exclusion Criteria

To ensure a focused and high-quality review, the following criteria were applied:

6.1. Inclusion Criteria:

- Peer-reviewed journal articles, conference papers, dissertations, and government reports.
- Studies published between 2000 and 2024 to track e-learning evolution over two decades.
- Research focused on higher education institutions.
- Articles addressing infrastructure, faculty/student perceptions, LMS adoption, or policy issues in Libya.
- Comparative studies examining e-learning in Libya and other MENA/international contexts

6.2. Exclusion Criteria:

- Studies unrelated to higher education.
- Articles lacking empirical data or theoretical grounding.
- Non-English or non-Arabic papers unless a verified translation was available.
- Opinion pieces, blog articles, or unverified non-academic source.

Below is the PRISMA flowchart outlining the study selection process:

- **Identification:** Records identified through database searches (n = 150)

- **Screening:** Records after duplicates removed (n = 120)
- **Eligibility:** Full-text articles assessed for eligibility (n = 50)
- **Included:** Studies included in final review (n = 20)

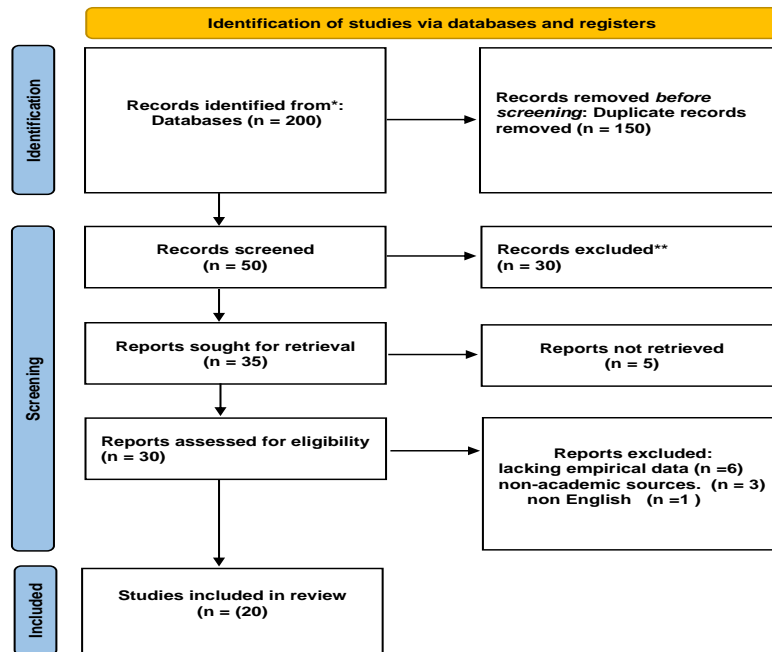


Figure (1): PRISMA flowchart outlining the study selection process.

7. Results

Libya faces a number of challenges on the technological front because Libyan universities appear to lack the technological infrastructure. The use of educational software within universities is very limited due to the poor availability of Arabic software in the market [8]. Lastly, Libya does not recognize distance learning and e-learning as valid modes of education, and most Libyan universities have not appointed staff members with formal qualifications in either distance learning or e-learning. In fact, the Ministry of Higher Education, which is by law responsible for approving degrees from foreign universities, will not endorse a degree obtained through either distance learning or e-learning. Without the approval of the Ministry, students cannot gain advantages in the workplace from their degrees [9].

7.1 Comparative Analysis with International Findings

Libya faces multiple challenges that have slowed the adoption of e-learning:

1. Infrastructure Limitations

- **Unreliable Internet Access:** Many regions, especially rural areas, suffer from poor internet connectivity, making online learning difficult [7].
- **Limited ICT Resources:** Many universities lack modern computers, digital labs, and high-speed networks necessary for effective e-learning [6].

2. Faculty and Student Digital Literacy

- **Limited Technical Skills:** Many educators lack the necessary training to use Learning Management Systems (LMS) and digital teaching tools [5].
- **Resistance to Change:** Some faculty members and administrators prefer traditional teaching methods, viewing online education as less effective [10].

3. Policy and Institutional Barriers

- **Lack of National E-learning Strategy:** Unlike other MENA countries, Libya has no formal government policy outlining e-learning adoption in higher education [3].
- **Insufficient Funding:** Limited investment in ICT infrastructure and faculty training hampers large-scale implementation [4].

4. Educational and Curriculum-Related Issues

- **Lack of Interactive Content:** Most available digital learning materials are text-based, lacking multimedia or interactive components [1].
- **Assessment and Accreditation Concerns:** Universities struggle with ensuring the credibility of online assessments and preventing academic dishonesty [2].

Libyan universities have made several attempts to introduce e-learning, with varying degrees of success:

- **Adoption of Learning Management Systems (LMS):**

Some universities, such as the University of Tripoli, have experimented with Moodle and Blackboard to deliver online courses [7]. However, poor LMS integration, lack of faculty training, and inconsistent internet access have limited effectiveness.

- **Emergency Remote Teaching during COVID-19:**

During the pandemic, many universities shifted to online teaching using Zoom, Google Classroom, and WhatsApp for communication [5]. This transition was largely unstructured, with no clear policies, digital teaching standards, or long-term planning.

- **Limited Pilot Projects in Blended Learning**

Some universities have experimented with blended learning models, combining face-to-face teaching with digital resources. These initiatives have shown potential success, particularly in technical and engineering courses, but remain isolated pilot programs without nationwide adoption [10]. Some institutions have explored mobile-based learning through WhatsApp

groups and YouTube lectures due to students' high mobile penetration. While effective in urban settings, rural students face internet access issues, and the lack of structured LMS platforms reduces effectiveness [2].

Table 1. Comparative analysis with international findings

Aspect	Findings in Libya	Findings in International Studies
Infrastructure	Poor internet access, limited ICT resources	High-speed internet, advanced digital tools [11]
Faculty Training	Limited training and resistance to change	Continuous professional development programs [12]
Student Engagement	Low due to lack of interactivity and digital skills	High due to gamification and interactive learning [13]
Policy and Investment	Weak government support and funding	Strong policy frameworks and financial investments [14]
Success of Implementation	Partial success, mostly experimental	Well-integrated into curricula [15]

8. Discussion

The implementation of e-learning in Libya requires a deep understanding of the factors influencing the success or failure of such initiatives. The findings indicate that structural and institutional challenges represent the primary barriers to the widespread adoption of e-learning. Conversely, international experiences demonstrate that investment in infrastructure, faculty training, and the establishment of clear national policies are essential determinants of success.

8.1. SWOT Analysis of E-Learning Implementation in Libya:

Conducting a SWOT analysis is a fundamental step in evaluating the various factors prior to implementing e-learning solutions in any institution, as the success or failure of an e-learning initiative is directly linked to the quality of the strategic thinking that underpins it. An e-learning strategy can be likened to a map, providing the necessary directions for the journey toward successful implementation. It is essential to have an e-learning strategy in place before commencing the implementation process. Furthermore, the e-learning initiative must be aligned with the institution's core mission to ensure that organizational objectives are achieved [2]. Strategic analysis is beneficial for the successful implementation of e-learning and aims to assist decision-makers at the institutional level in identifying opportunities related to e-learning. This strategic analysis is based on the experiences and perceptions of faculty members, students, administrators, and technical staff regarding the use of web-based instruction within the institution.

Previous researchers have classified the barriers to e-learning adoption in Libya into four main categories: management barriers, technological barriers, cultural barriers, and other barriers such as cost [2]. These categories are detailed below:

A. Technological Barriers:

- Insufficient network and system infrastructure.
- Weak e-learning development in Libyan universities.
- Difficulties in overcoming initial implementation problems.
- Lack of experience in using technology and limited provision of reliable internet access.
- Lack of specialized student services [16].

B. Management Barriers:

- Absence of a national education strategy linking different stages of study, leading to difficulties in accepting e-learning in higher education.
- Lack of unified regulations or standards for e-learning across the country.
- Disapproval from the Ministry of Higher Education regarding e-learning courses.
- Difficulty in securing academic accreditation.
- Lack of cross-institutional collaboration [16].

C. Cultural Barriers:

- Unfamiliarity with the internet and related technologies results in a lack of appreciation and understanding of e-learning and its benefits.
- Resistance to adopting the necessary educational changes (e.g., self-regulation, student-centered learning) required for successful e-learning implementation [2].

A significant finding of the SWOT analysis is that the language barrier delays e-learning adoption in Libya, particularly because Arabic is the official language, while most faculty members and students lack English proficiency, and the majority of online materials and references are written in English. The Libyan Ministry of Higher Education has begun rehabilitating universities, including open universities, by attempting to utilize e-learning and information and communication technology (ICT) to deliver knowledge. However, this requires creating an environment in which new learning methods are encouraged and accepted. The Ministry's policy for applying ICT in education primarily aims to increase the availability of ICT applications and tools. Consequently, infrastructure must be rebuilt to support ICT requirements, ensuring the best possible learning tools—such as devices, materials, strategies, and media—to keep pace with advances existing in other countries [10]. Nevertheless, due to the civil war and ongoing conflict in Libya, internet access is often weak or interrupted, and academic staff require training to effectively use ICT to deliver knowledge and skills online [17].

Table 2. SWOT analysis of e-learning in Libya (Updated based on recent literature 2015–2024

Strengths	Weaknesses
1. Availability of computers and educational software in some institutions	1. Poor ICT infrastructure and unreliable internet connectivity [6][7]
2. Growing interest from Ministry of Education in supporting e-learning initiatives	2. Low completion and graduation rates in e-learning programs
3. High mobile phone penetration among students enabling mobile learning opportunities [2]	3. Resistance to change among faculty and administrators [10]
4. Existence of pilot programs in blended learning at some universities [5]	4. Poor quality of educational curricula and outdated teaching methods
	5. Lack of legislative frameworks and administrative imbalances
	6. Insufficient funding and investment in digital infrastructure [4]
Opportunities	Threats
1. Acquisition of language and information technology skills by students	1. Lack of sustained government support and policy continuity [3]
2. Comfortable and flexible education models suited to students' needs	2. Competition from foreign online universities and MOOCs
3. Restoration and redefinition of quality concepts in higher education	3. Ongoing political instability and security challenges affecting infrastructure
4. Leading the development of sustainable study plans for higher education	4. Brain drain and loss of qualified ICT professionals
5. International partnerships and collaborations for e-learning development	5. Rapid technological changes requiring continuous adaptation

9. Conclusions

E-learning is dependent on technology to deliver instructional content. Libyan higher education universities, including open universities, must make decisions about technology issues prior to the institution's implementation of e-learning strategies. Beyond questions of what type and how much hardware and software will be needed, institutions must consider how

new technology will be supported. It is important for higher education universities to determine how to use technology as a teaching tool framed within their particular learning style and to change their existing teaching and learning methods in accordance with e-learning models. The implementation of e-learning in an official work setting can present difficulties for an organization and requires comprehensive strategic planning

10. Recommendations

To overcome policy and institutional barriers, Libya must adopt a national digital education strategy, invest in faculty training, improve funding mechanisms, and establish clear e-learning policies. By following successful models from other countries, Libya can transition from experimental e-learning efforts to a fully integrated, sustainable digital education system. To create a sustainable and effective digital learning ecosystem, Libya should adopt the following policy recommendations:

10.1. Policy Reforms for E-Learning Adoption in Libya

1. National E-Learning Strategy Needed:

- Establish a clear national framework for integrating e-learning into university curricula.
- Create a government-led digital education task force to oversee implementation.
- Ensure alignment with global best practices and accreditation standards.

2. Infrastructure Development:

- Expand broadband and fiber-optic internet access, especially in rural areas.
- Provide subsidized internet and digital devices for students from low-income backgrounds.
- Invest in solar-powered digital hubs to combat frequent power outages.

3. Faculty Training & Incentives:

- Implement continuous professional development programs for university instructors.
- Provide financial incentives, promotions, or certifications for faculty who adopt e-learning.
- Establish a national center for e-learning excellence to support educators.

4. Funding & Investment:

- Establish a dedicated e-learning fund within the Ministry of Higher Education.
- Seek international partnerships and grants for e-learning development.
- Allocate budget for ICT infrastructure upgrades in universities.

5. Standardized LMS Integration:

- Adopt a government-recommended LMS (Moodle, Blackboard, or equivalent) across all universities.
- Ensure technical support and training for LMS users.

6. Digital Literacy Programs:

- Introduce ICT training into curricula for all students.
- Offer basic digital skills courses for faculty and staff.

7. Accreditation & Quality Standards:

- Create national policies for online degree accreditation.
- Develop quality assurance frameworks for e-learning programs.
- Ensure recognition of e-learning qualifications in the labor market.

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