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Distance Learning in Algeria and the Challenge of the Digital Divide

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Abstract:

The digital divide poses a major challenge that affects Distance Learning in the age of digital transformation. The quality of education is directly influenced by the disparity in the availability and use of digital technologies. This study seeks to investigate the concept and dimensions of the digital divide and to evaluate its implications for higher education through a set of indicators. It also discusses the reality of distance learning in Algeria, highlighting the specific challenges it faces, particularly those related to weak digital infrastructure, lack of training, and differences in digital skills. The study concludes with a set of recommendations aimed at reducing the digital divide and strengthening digital capacities to enhance the quality of higher education

Keywords: Algeria, digital transformation, digital divide, distance learning, higher education quality

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1. Introduction

In light of the rapid technological developments, higher education has increasingly relied on digital technologies and online platforms as a means to deliver distance teaching and learning. In Algeria, digital transformation emerged as a response to the challenges posed by technological advancement and exceptional circumstances such as the COVID-19 pandemic. However, one of the major issues in applying this mode of education lies in the digital divide, which affects the ability to access and effectively use digital technologies. This divide is manifested in the disparity between those who possess sufficient digital resources and those who suffer from a lack of infrastructure and digital literacy (UNESCO, 2020), which negatively affects the quality and effectiveness of higher education.

Therefore, this study discusses the reality of distance learning in Algeria, with a focus on the issue of the digital divide that hinders the achievement of quality higher education.

This study adopts a descriptive-analytical approach by combining a review of relevant literature, studies, and reports (including UNESCO reports and national studies) with a critical analysis of the reality of distance learning in Algeria.

Accordingly, the following research question is raised: To what extent does the digital divide affect distance Learning and, consequently, the quality of higher education in Algeria?

To answer this question, the research is structured around the following points:

- Distance Learning and the digital divide: A conceptual study

- Indicators for measuring the impact of the digital divide on higher education
- The reality of distance learning in Algeria and the challenge of the digital divide

2. Distance Learning and the Digital Divide – A Conceptual Study

This section addresses the concept of distance learning, the digital divide, and its indicators, as follows:

2.1. The Concept of Distance Learning

Distance learning is defined as an educational system that uses information and communication technologies (ICT) to deliver educational content and facilitate interaction between faculty members and students through digital platforms (Jaggi, 2015). This concept has evolved with the emergence of new technologies and has come to include e-learning, which relies on the Internet and multimedia technologies.

2.2. The Concept of the Digital Divide

The digital divide is defined as the disparity in access to and effective use of digital technologies among individuals, communities, and institutions. This divide is not limited to the material aspect, such as the availability of devices and internet services, but also includes cognitive and skill-related dimensions that affect how technology is used in different fields, particularly in education (Van, 2020).

The digital divide can be categorized into three main dimensions:

-Material dimension: Refers to the disparities in the availability of electronic devices (such as computers and smartphones) and internet services with adequate speeds (OECD, 2019).

-Cognitive dimension: Relates to the users' skills and competencies in handling technology and using it for research and learning (Hilbert, 2011).

-Usage dimension: Refers to how these technologies are utilized in educational and research activities and their impact on the quality of the educational process (DiMaggio & Hargittai, 2001).

3 . Indicators for Measuring the Impact of the Digital Divide on Higher Education

Several key indicators are relied upon to measure the impact of the digital divide on the higher education sector, the most important of which are**:**

- **Internet penetration rate and speed**: The rate of internet penetration and its quality are considered key indicators, as they are directly linked to the ability of institutions to efficiently provide digital education (ITU, 2020).

- **Level of investment in Information and Communication Technology (ICT):** The rate of public and private spending on upgrading digital infrastructure reflects the readiness of universities to implement distance education (OECD, 2019).

- **Digital competence of faculty members**: This can be measured through surveys and digital skills assessments. Such indicators help identify the gap in technical skills among professors (European Commission, 2018).

- **Rate of use of educational platforms:** This indicator is measured by the level of interaction between students and professors on digital platforms, reflecting the effectiveness of the online educational process (UNESCO, 2020).

4. The Reality of Distance Learning in Algeria and the Challenge of the Digital Divide

Distance learning in Algeria is a relatively recent experience that has undergone profound transformations across three main stages: before the COVID-19 pandemic, during the pandemic, and in the post-

pandemic period. The global health crisis accelerated the adoption of digital education while simultaneously exposing the digital divide among different groups, which has become one of the major challenges facing the higher education sector in Algeria.

4.1. Stages of the Development of Distance Learning in Algeria

Distance education in Algeria has gone through three main stages: before the COVID-19 pandemic, during the pandemic, and after it.

4.1.1 Distance Learning in Algeria before COVID-19

Before the outbreak of COVID-19, e-learning in Algeria was still in its early stages. Educational institutions largely relied on traditional face-to-face teaching methods, with a few universities beginning to experiment with blended learning models. The adoption of ICT in education faced major challenges, including a lack of resources and technological infrastructure. Initiatives related to e-learning were limited and often depended on individual efforts from faculty members rather than being part of an integrated national strategy (Ameur, 2024, p.55).

4.1.2 Distance Learning during the COVID-19 Pandemic

The COVID-19 pandemic acted as a catalyst for the rapid adoption of e-learning in Algeria. With the closure of educational institutions in early 2020, there was an urgent need to shift to online learning to ensure continuity of education. This transition was characterized by the widespread use of digital platforms, video conferencing tools, and online resources. Despite the challenges, many institutions were able to quickly implement e-learning solutions, highlighting its potential to

reach a wider audience, especially in remote and underserved areas. Studies showed an increasing acceptance of e-learning among both teachers and students during this period.

4.1.3 Distance Learning after the COVID-19 Pandemic

In the post-COVID-19 era, e-learning has become an integral part of Algeria's educational landscape. Educational institutions have built on the experiences and lessons learned during the pandemic to develop more robust e-learning systems. Many institutions adopted hybrid models that combine online and face-to-face learning to provide greater flexibility and meet diverse learning needs

(Ameur, 2024, p.56).

Thus, distance learning in Algeria evolved through three main stages, which can be summarized as follows:

-Before COVID-19: E-learning was in its early stages, with limited adoption and significant obstacles preventing its implementation.

-During COVID-19: The pandemic led to the rapid and widespread adoption of e-learning, revealing both the potential and the challenges of online education.

-After COVID-19: E-learning became more stable, with hybrid models emerging as a common approach. However, there remains a pressing need to improve infrastructure, digital literacy, and institutional support in order to fully harness the potential of e-learning in Algeria. This is what is referred to as the digital divide (Ameur, 2024, pp.55–56).

4.2. Challenges of the Digital Divide

The transition to online learning during the COVID-19 pandemic significantly exposed disparities in access to technology and the lack of digital skills among Algerian students and faculty. This shift underscored the digital divide, revealing that many students from low-income families and rural areas faced major barriers to effective online learning. The divide is reflected in several key areas.

4.2.1. The Digital Divide and Access Issues: Weak Digital Infrastructure

- **Limited access to technology**: Many students, particularly from low-income households, faced financial barriers that restricted their ability to acquire essential digital devices and reliable internet connectivity—both of which are crucial for participating in online education. This situation widened the educational gap
(Anburaj, 2024).

- **Geographic disparities**: The lack of digital infrastructure in certain regions hindered students' ability to engage with online learning platforms, leading to negative academic outcomes (Alikhan & Sritharan, 2024). The digital divide, especially in southern regions, remains a critical issue requiring further investigation. Addressing this gap will be vital to developing a more inclusive and effective e-learning system in Algeria.

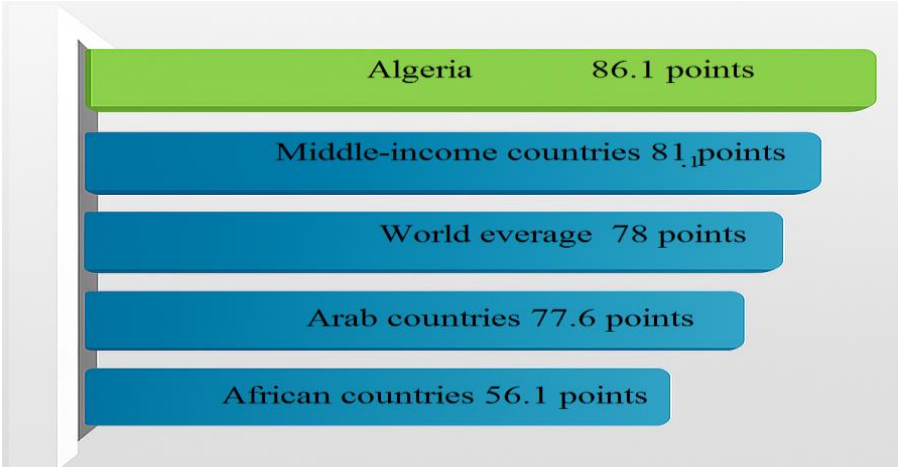
Focusing on the issue of internet access and weak digital infrastructure, the ICT Development Index (IDI) -which is used to measure the digital divide and compare the performance of the ICT sector within and across countries -indicates that Algeria witnessed gradual improvements in internet access indicators during the period

2020–2021. However, disparities remain between urban and rural areas. Internet penetration reached 48.3% in 2020 and increased to **52.7%** in **2021,** while the number of internet users rose from around 23.4 million to 25.3 million. Average internet speed also improved from 8.5 Mbps to 9.2 Mbps. Nevertheless, infrastructure and training challenges continue to hinder the full potential of distance education (ITU, 2020; Algerian Ministry of Higher Education and Scientific Research, 2020).

This was indeed evident during the COVID-19 crisis, when the shift to distance learning forced us to face several problems, including weak infrastructure and disparities in internet access, which negatively affected the quality of education at the time and whose consequences are still being felt today.

According to the latest report issued by the International Telecommunication Union (ITU) in July 2025, Algeria has made remarkable progress in the ICT Development Index (IDI). After ranking 88th in 2023 among 169 ITU member states, it has advanced to the 74th position worldwide, achieving a leap of 14 places. This also represents a notable progress of 15 places compared to last year's ranking of 89. Algeria obtained a total score of 86.1 points, thereby surpassing the global average of the ICT Development Index (78 points), as well as exceeding the averages of the Arab region (77.6 points), African countries (56.1 points), and the upper-middle-income country group (81.1 points). (Ministry of Post and Telecommunications, 2025)

Figure 01: ICT Development Index (IDI) for Algeria in 202 5 Compared to Its Surroundings



Source : (**Ministry of Post and Telecommunications, 2025)**

Although the results of the ICT Development Index (IDI) for 2025 reflect a significant improvement in internet access indicators in Algeria, actual usage rates remain relatively lagging compared to some neighboring countries. This is primarily attributed to challenges related to infrastructure, disparities in geographical coverage, as well as certain economic and social barriers. This situation calls for strengthening national efforts aimed at achieving broader and more effective digital inclusion.

4.2.2. Disparities in Digital Skills:

-Lack of training and technical support for faculty members: Professors often lack the necessary training to effectively engage in e-learning technologies, which hinders their ability to deliver quality online education (Aouissi, 2024). In addition, technical support in some institutions is limited, restricting professors' ability to fully utilize the platforms.

-Digital illiteracy: Differences in digital literacy among students have exacerbated challenges, as some struggle to navigate online platforms effectively (Alikhan & Sritharan, 2024; Sarnou, 2024).

4.2.3 Economic and Social Disparities:

Economic inequalities lead to differences in universities' investment in technology, further deepening the digital divide (OECD, 2019).

4.2.4 Resistance to Change:

The use of educational platforms faces resistance from some professors who prefer traditional teaching methods and view modern technologies as a challenge to their established educational system. This resistance may stem from uncertainty about the effectiveness of digital tools or fear of losing control over the educational process (DiMaggio & Hargittai, 2001).

While these challenges are significant, they also represent an opportunity for Algerian universities to strengthen digital literacy programs and improve digital infrastructure, ultimately fostering a more inclusive and effective learning environment.

To overcome these challenges and reduce their impact, Algeria has launched several initiatives and strategies that reflect its serious efforts to improve the quality of higher education, including:

-Government initiatives: The Algerian government has launched several projects to develop digital infrastructure in universities, including upgrading internet networks, introducing learning management systems (LMS), developing digital learning platforms, and providing digital educational resources.

-International partnerships: Some Algerian universities have begun collaborating with international institutions to enhance digital competencies and exchange expertise in the field of digital education.

-Support for scientific research and innovation: Algerian universities seek to strengthen scientific research by providing an advanced digital environment that enables faculty members and students to access global databases and modern research tools.

5. Conclusion:

The digital divide constitutes a fundamental challenge affecting distance learning, as disparities in the availability of digital technologies and skills lead to unequal educational outcomes. Enhancing digital infrastructure and developing technical skills among faculty members can contribute to raising the quality of higher education. The case of Algeria demonstrates that efforts to modernize digital systems and provide continuous training result in noticeable improvements, despite persistent challenges in some regions. Adopting comprehensive policies and maintaining sustained investment in technology represent the key pathway to bridging the digital divide and achieving high-quality education that meets the demands of the digital age.

This study concludes with a set of recommendations:

- Enhancing investment in technology: Relevant stakeholders in Algeria should increase spending on upgrading digital infrastructure and providing modern equipment in universities, especially in remote areas.

- Developing training programs and technical support: It is advisable to establish internal training centers for academic staff within universities to strengthen their digital skills, in addition to forming partnerships with international institutions for knowledge exchange.

- Improving digital evaluation standards: A comprehensive system should be developed to monitor and evaluate the impact of digital infrastructure on the quality of higher education, using precise benchmark indicators (European Commission, 2018).

- Strengthening international and regional partnerships: Collaboration with international universities and research institutions is an essential step to exchange best practices and update digital curricula.

- Supporting scientific research and innovation: Scientific research in the field of digital education should be encouraged to provide reliable data that contribute to formulating appropriate policies to bridge the digital divide.

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