# ICT Implementation in E-Learning: Case Study of Public Institutions in Morocco

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**Abstract:** This article examines the implementation of ICT in e-learning within public institutions in Morocco during the COVID-19 lockdown. Through a quantitative approach based on an online questionnaire, it investigates learners' satisfaction and perceptions of digital learning environments. The findings reveal major challenges in ICT deployment, including poor course planning, lack of interactivity in televised lessons, and weak communication between students and teachers. These issues contributed to learner dissatisfaction and a sense of isolation. Despite the increased reliance on ICT, many students found the tools insufficiently adapted to effective learning needs. The study underscores the importance of improving digital infrastructure, providing better teacher training, and designing more interactive and engaging online content. This case study highlights the urgent need for public institutions to rethink their strategies for ICT integration to enhance the quality and inclusiveness of e-learning.

**Keywords:** ICT – E-learning – Public institutions – Morocco – Student perception

## Mise en œuvre des TIC dans l'e-learning: étude de cas dans des établissements publics au Maroc

**Résumé:** Cet article examine la mise en œuvre des TIC dans le e-learning au sein des établissements publics marocains durant le confinement lié à la COVID-19. En s'appuyant sur une approche quantitative via un questionnaire en ligne, l'étude explore la satisfaction et la perception des apprenants vis-à-vis des environnements numériques d'apprentissage. Les résultats révèlent des défis majeurs liés à l'utilisation des TIC : mauvaise planification des cours, faible interactivité des leçons télévisées et communication limitée entre enseignants et étudiants. Ces lacunes ont engendré un sentiment d'isolement et une insatisfaction notable chez les apprenants. Malgré une forte mobilisation des outils numériques, ceux-ci ont été jugés peu adaptés aux besoins réels de l'apprentissage. L'étude souligne l'urgence, pour les institutions publiques, de repenser leurs stratégies d'intégration des TIC afin d'améliorer la qualité et l'inclusivité du e-learning.

**Mots-clés :** TIC – E-learning – Institutions publiques – Maroc – Perception des étudiants

## Introduction

In recent decades, distance learning has evolved significantly, particularly in higher education, reshaping traditional pedagogical models. This transformation has required both educators and learners to rethink their approaches to teaching, communication, and collaboration, in response to the unique demands of virtual education (M. G. Moore & G. Kearsley, 2012, p. 1). At the heart of this evolution lies the integration of Information and Communication Technologies (ICT), which have facilitated the development of e-learning environments and enabled more flexible and scalable instructional models (T. Anderson, 2008, p. 59).

Defined by the separation of teacher and learner in time and space, e-learning allows students to engage with academic content beyond the physical classroom. ICT tools—including platforms, software, and multimedia applications—have become essential to delivering and managing educational experiences. They offer new ways to access, process, and exchange knowledge (A. W. Bates, 2015, p. 104), and not only replicate the functions of traditional teaching but also enhance interactivity and personalization (B. Means et al., 2010, p. 45).

As ICT becomes increasingly embedded in academic systems, its influence extends from the logistics of course delivery to the very core of pedagogical design. Institutions are thus encouraged to rethink teaching strategies, invest in teacher training, and create inclusive digital environments that promote active engagement and improve learning outcomes (N. Selwyn, 2016, p. 101). These developments raise important questions: to what extent do digital platforms support pedagogical effectiveness? Do they enable the achievement of learning objectives as efficiently as traditional methods?

This study aims to examine the pedagogical value of e-learning in Moroccan higher education, with particular attention to the platforms Moodle and Rosetta Stone. Our central hypothesis is that well-integrated digital platforms—when aligned with sound instructional design—can improve learner engagement, autonomy, and overall outcomes.

Drawing on constructivist and connectivist theories, this research combines a review of literature with empirical data collected from instructors and platform administrators at the University Ibn Zohr.

## 1. Theoretical and Contextual Background

### 1.1. The Evolution of Distance Learning

Distance education has significantly evolved, transitioning from traditional correspondence to interactive digital environments. According to Nipper, cited by P. Peraya (2005, p. 12), three historical phases characterize this transformation. The first relied on postal correspondence, with printed texts sent to learners, fostering independent study. The second phase introduced multimedia tools such as printed media, radio, and television broadcasts during the 1960s and 70s, enabling broader educational outreach (P. Charlier et al., 2001, p. 45). The third phase, spurred by advances in computing and telecommunications in the late 1980s, marked the digital era of distance learning, giving rise to “virtual campuses” (P. Peraya, 2003, p. 67).

### 1.2. From Correspondence to Intelligent Platforms

Distance education originated with correspondence courses in the 19th century (M. G. Moore & G. Kearsley, 2011, p. 45). Technological advances in the 1970s (M. Ally, 2009, p. 72) and the 1990s, including AI and adaptive learning systems (P. Brusilovsky, 2001, p. 90), transformed learning environments. Recent developments such as gamification, immersive technologies, and MOOCs further illustrate the potential of ICT to revolutionize access and interaction (S. Deterding et al., 2011, p. 10).

## 2. Literature Review and Thematic Analysis

### 2.1. ICT and Pedagogical Transformation

ICT has reshaped education by enriching pedagogical strategies and promoting interactive and inclusive learning environments (P. Perrenoud, 1998, p. 15; P. Peraya, 2002, p. 22). Strategies such as flipped classrooms (J. L. Bishop & M. A. Verleger, 2013, p. 8) and adaptive learning (W. Holmes, M. Bialik & C. Fadel, 2019, p. 34) benefit from digital integration. ICT also enhances inclusion and accessibility (UNESCO, 2020, p. 7), though issues like the digital divide and insufficient teacher training remain (J. Van Dijk, 2006, p. 38).

### 2.2. Tools and Barriers in Digital Education

Successful digital learning relies on both technology and pedagogy (A. W. Bates, 2015, p. 110). Platforms like Trello and Moodle support collaboration and learner autonomy. Charnet (2019) proposes a ten-step pedagogical framework. Yet, barriers persist: digital illiteracy (W. Ng, 2012, p. 20), time management issues (J. Broadbent & W. L. Poon, 2015, p. 30), and reduced interaction (C. Rapanta et al., 2020, p. 25) challenge effectiveness. Solutions include better training and accessible, inclusive technologies (C. Redecker, 2017, p. 22; R. B. Kozma, 2005, p. 40).

## 3. Problem Statement and Objectives

### 3.1. Problem Statement and Significance

This study investigates the implementation of Information and Communication Technologies (ICT) in distance learning, with a focus on students' perceptions during the COVID-19 pandemic. The global shift to online education—especially during the March 2020 lockdown—forced educational institutions to rapidly adopt digital tools to ensure continuity of learning (S. Dhawan, 2020, p. 5). This context offers a unique opportunity to assess how ICT integration affected student motivation, academic engagement, and learning outcomes.

The research aims to identify both the opportunities and limitations of online education as experienced by learners. Major barriers such as limited access to devices, low digital literacy, and reduced teacher-student interaction have been widely reported (O. B. Adedoyin & E. Soykan, 2020, p. 9). Conversely, advantages like schedule flexibility and digital resource accessibility have been noted as contributing factors to student satisfaction (J. Crawford et al., 2020, p. 12).

Understanding students' feedback is essential for rethinking ICT integration in future educational reforms. Moreover, the study emphasizes the importance of inclusive access to technology,

ongoing teacher training, and the development of engaging virtual environments to maintain educational quality and equity.

### 3.2. Objectives of the Study

This study seeks to understand how distance learning, particularly through the integration of ICT, contributes to learners' satisfaction and affects teaching practices. With the growing adoption of digital tools, it is essential to examine how online learning has reshaped traditional education and supported learners in adapting to new formats. The study addresses how students engage with digital tools, the strategies they adopt, and the resources they find most effective.

ICT has not only provided alternatives to in-person instruction but also transformed pedagogical dynamics by enabling personalized learning paths, increased autonomy, and flexible access to knowledge (T. Anderson, 2008, p. 23). However, challenges such as unequal access, limited digital skills, and lack of motivation continue to affect the learning experience (O. B. Adedoyin & E. Soykan, 2020, p. 9).

One objective of the study is to evaluate how digital platforms and tools were integrated during the COVID-19 lockdown and how students perceived their effectiveness. Understanding learners' perspectives on course quality, teacher support, and their own achievement is vital for improving future online education models (S. Dhawan, 2020, p. 15). Furthermore, fostering collaboration and community in virtual environments is crucial for maintaining engagement and supporting learner success (D. R. Garrison, 2003, p. 8).

### 3.3. Scope of the Study

The target population for this study comprises learners who experienced distance education for the first time during the COVID-19 lockdown. This group was selected due to the unprecedented nature of their transition from face-to-face learning to fully online environments, which significantly altered their learning experience. These students had to adapt rapidly to digital tools, home-based learning environments, and reduced social interaction—factors that may have impacted their motivation, engagement, and perception of learning quality (O. B. Adedoyin & E. Soykan, 2020, p. 9).

Data were collected from 200 volunteer learners, of which 149 completed the questionnaires in full. This sample, drawn from diverse academic backgrounds and disciplines, offers a representative overview of students' experiences during the lockdown period. The richness of this data provides valuable insights into how digital education tools were received and the extent to which learners were able to adjust.

Studying this population allows for an evaluation of both the challenges and benefits of emergency remote teaching. Understanding how these learners perceived online education is key to identifying areas for pedagogical improvement, especially regarding technological access, learner support, and instructional design (A. Bozkurt & R. C. Sharma, 2020, p. 12). The results are intended to inform future digital education strategies that are better aligned with student needs and learning conditions under crisis scenarios.

### 3.4. Study Question

Sampling plays a fundamental role in ensuring the reliability and validity of research findings. In this study, the sampling process aimed to select a group of learners whose experiences during the COVID-19 lockdown could reflect broader trends in distance learning. Specifically, the study

focused on students experiencing online education for the first time. A quantitative approach was employed, using a structured online questionnaire to collect data on learners' perceptions of ICT integration in the educational process, as well as their overall satisfaction with remote learning.

The questionnaire was designed to capture a range of indicators related to ICT tools, student engagement, motivation, and perceived learning outcomes. Questions addressed the effectiveness of various digital platforms, the frequency and quality of teacher-student communication, and the degree to which online tools supported autonomy and active learning. As noted by J. W. Creswell & J. D. Creswell (2018, p. 45), careful instrument design is essential to ensure valid and actionable results in survey-based research.

The target population included students from diverse academic backgrounds, ensuring a heterogeneous sample. Out of 200 responses, 149 were fully completed and retained for analysis. This sample size provided a solid base for identifying trends and evaluating the impact of ICT on student satisfaction.

Moreover, the study aimed to explore whether the integration of digital tools effectively supported learning or created new barriers, as raised by P.-C. Sun et al. (2008, p. 1185) in their evaluation of e-learning satisfaction. Attention was also given to equity and accessibility issues, a concern shared by B. Means et al. (2014, p. 5), who emphasize the importance of addressing digital divides in educational settings.

Ultimately, the findings are intended to guide institutions in refining their digital strategies, ensuring inclusive and high-quality distance learning. The study also advocates for enhanced teacher training in educational technologies and recommends institutional investments in digital infrastructure and student support systems. These measures are essential to make distance education more engaging, equitable, and resilient in the face of future disruptions.

## 4. Methodology

### 4.1. Research Design and Data Collection

To collect relevant and reliable data for this study, an online questionnaire was developed using Google Forms, selected for its intuitive interface, wide accessibility, and suitability for reaching a large number of participants remotely. This platform allowed for organized data collection, facilitating efficient analysis. The questionnaire was designed to gather quantitative data on learners' perceptions and experiences with distance learning, focusing on the use and perceived effectiveness of Information and Communication Technologies (ICT).

Given that most participants were experiencing distance learning for the first time during the COVID-19 lockdown, the questionnaire primarily included closed-ended and multiple-choice questions. This format was selected to improve response rates and minimize data loss due to incomplete open-ended answers—a limitation noted in similar educational research (A. Bryman, 2016, p. 312). The structured nature of the survey ensured consistent responses, supporting valid comparisons and statistical interpretation.

### 4.2. Data Processing and Analysis

Once the responses were collected, data coding and statistical analysis were conducted using IBM SPSS Statistics 26, a widely recognized tool for quantitative research (A. Field, 2018, p. 45). SPSS enabled the research team to clean the data, check for anomalies, and apply descriptive and inferential statistical methods to explore patterns. The software allowed for correlation analysis

between variables such as satisfaction, motivation, digital tool use, and academic engagement. Furthermore, demographic variables—such as age, educational level, and prior technological exposure—were used to identify potential differences in perception and experience, echoing approaches found in studies by N. Selwyn (2016, p. 58).

This methodological combination of Google Forms for data collection and SPSS for analysis provided both reliability and depth. It facilitated an evidence-based understanding of how ICT tools are shaping learners' experiences in online education. The findings not only reflect learners' satisfaction and challenges but also offer practical insights for improving future digital learning environments.

Moreover, this research underlines the importance of inclusive design in online education. As pointed out by T. Anderson (2008, p. 120), digital tools must be adapted to diverse learner needs to avoid deepening educational inequalities. Thoughtful integration of technology, paired with user-friendly pedagogical strategies, is essential to ensure that online learning remains effective and equitable.

### 4.3. Research Instrument

The questionnaire employed in this study was processed and analyzed using IBM SPSS Statistics 26 within a Windows environment, which ensured systematic data management and accurate statistical interpretation. This choice of software is widely recommended in educational research for its reliability and ability to handle large datasets efficiently (A. Field, 2018, p. 50). The central goal of the questionnaire was to explore learners' perceptions of distance education and the digital tools used throughout their online learning experience.

To reach a wide and diverse population, the survey was disseminated via multiple online platforms and social media networks, a strategy aligned with best practices in online educational studies (J. R. Evans & A. Mathur, 2005, p. 198). The questionnaire comprised 20 carefully designed items and was divided into five thematic sections for clarity and analytical consistency.

- Section 1 gathered demographic data (age, level of study, prior exposure to ICT), which facilitated the identification of trends based on learner profiles.
- Section 2 focused on general perceptions of distance education (AED), allowing an overview of students' familiarity and comfort with this mode of instruction.
- Section 3 investigated the digital tools and platforms used during remote courses, exploring aspects such as usability and frequency of use.
- Section 4 assessed technical dimensions—reliability, accessibility, and user interface issues—important for evaluating tool effectiveness (M. Alrasheedi, L. F. Capretz & A. Raza, 2015, p. 24).
- Section 5 gathered students' overall evaluations of their experience, offering insights into satisfaction, motivation, and suggested improvements.

A six-point Likert scale was used throughout, ranging from "strongly agree" to "strongly disagree," with no neutral option. This design was deliberate, as it encourages respondents to take a clear stance and reduces the central tendency bias often seen in attitudinal surveys (A. Joshi, S. Kale, S. Chandel & D. K. Pal, 2015, p. 398).

The survey content emphasized the role of ICT in classroom settings, exploring which tools were perceived as effective or inadequate. The responses helped determine whether digital platforms facilitated or hindered learning, a key element in designing future ICT-based educational strategies (N. Selwyn, 2016, p. 62). The feedback obtained provides critical insights into the alignment between learners' needs and current technological implementations, supporting efforts to make digital education more responsive, engaging, and inclusive.

## 5. Results and discussion

### 5.1 Information and Communication Technologies used to follow distance learning

**Table 1 The participant's age groups**

| Age | Participants | Percentages |
|---|---|---|
| **under 18 years of age** | 51 | 34,3 |
| **18 to 28 years** | 65 | 43,6 |
| **29 to 39 years** | 26 | 17,4 |
| **40 to 50 years** | 6 | 4,0 |
| **51 to 61 years** | 1 | 0,7 |
| **Total** | 149 | 100,0 |

**Author's data (HOMRI, 2025).**

The participants' age is a crucial factor in analyzing learners' data. According to the survey, the sample is predominantly adult, with 65.7% of respondents aged 18 and above. The remaining 34.3% are minors, mainly high school and primary students under 18 years old. This demographic diversity may influence learners' experiences and perceptions of distance education, as age affects adaptability to digital learning tools and autonomy in self-regulated learning (B. Bakia et al., 2012, p. 34; E. Hargittai, 2010, p. 15).

Moreover, the geographical distribution of the sample reveals that a significant majority—80.5%—of learners are from urban areas, while 19.5% come from rural regions. This distinction has important implications because learners in rural areas often face additional challenges in accessing the infrastructure necessary for effective distance learning (UNESCO, 2020, p. 12). The persistent digital divide between urban and rural learners influences both access and quality of digital education (J. DiMaggio & E. Hargittai, 2001, p. 62).

Concerning internet connectivity, the study highlights disparities: 32.9% of learners use 3G/4G connections, whereas 63.7% have access to higher-speed internet such as ADSL or fiber optic. Alarmingly, 3.4% reported having no internet connection, which raises concerns about equity in access to distance learning. Limited or absent internet access severely restricts learners' ability to engage in both synchronous and asynchronous activities, exacerbating educational inequalities (J. Van Dijk, 2005, p. 45; OECD, 2021, p. 27).

Regarding technological devices, the survey shows that most learners have access to essential digital tools. A majority—71.8%—use laptops for online courses, while 82.6% use smartphones. Tablets are used by a smaller group, 11.4%, indicating that laptops and smartphones remain the preferred devices for distance learning, likely due to their portability and versatility (T. Anderson, 2008, p. 28). However, reliance on smartphones can present challenges related to screen size, multitasking, and typing difficulties, especially for content requiring extensive reading or writing (R. Traxler, 2009, p. 45). This underlines the importance of designing adaptable, mobile-friendly courses that accommodate varying device capabilities and user contexts.

### 5.2. Learner Interactivity and Satisfaction in Distance Learning

According to the survey results, the media most frequently used by teachers, as reported by learners, are moderately interactive courses conducted on open platforms, with 42.3% of respondents selecting this option. However, 8.7% of learners expressed dissatisfaction with the level of interactivity, perceiving these courses as non-interactive. Conversely, only 5.4% of learners reported being very satisfied with the interactive nature of the courses. These findings highlight the variable effectiveness of online teaching formats regarding learner engagement, a challenge well documented in digital pedagogy research (T. Anderson, 2008, p. 54; G. Salmon, 2000, p. 22).

Regarding the use of video capsules as a learning tool, over 48% of learners indicated these resources helped facilitate their understanding of course content. In contrast, 40.3% considered them moderately effective, while 11.4% found them incomprehensible. This suggests that while video-based instruction enhances learning for a majority, it is not universally effective. Learner preferences and levels of digital literacy significantly influence the perceived usefulness of such content (R. Mayer, 2009, p. 36; J. Guo, J. Kim & R. Rubin, 2014, p. 18).

The study further reveals that interactive courses conducted through social media platforms such as Facebook and Instagram are highly favored, with 72.5% of learners reporting their use. Digital media (68.5%) and online platforms such as Google Meet (49%), Microsoft Teams (32.9%), and Zoom (13.4%) also remain prominent tools for maintaining teaching continuity. This reflects the adaptability of both teachers and learners in navigating various digital ecosystems, as well as the growing reliance on social platforms to support both informal and formal learning (N. Greenhow & C. Lewin, 2016, p. 47).

However, the variation in platform usage—especially in terms of popularity and accessibility—highlights the need for standardized digital strategies and equitable access to technology. Studies emphasize that platform familiarity, ease of use, and device compatibility are crucial factors influencing platform effectiveness in online education (K. Martin et al., 2020, p. 29; Trust & Whalen, 2020, p. 15). Thus, educational institutions must ensure not only the availability of digital tools but also prioritize training and support systems to optimize their pedagogical use.

**Table 2 : the level of interaction between the teacher and the learner during distance learning**

| Scale from 1 to 5 | Participants | Percentages |
|---|---|---|
| 1 | 21 | 14,1 |
| 2 | 36 | 24,2 |
| 3 | 56 | 37,6 |
| 4 | 31 | 20,8 |
| 5 | 5 | 3,4 |
| TOTAL | 149 | 100,0 |

**Author's data (HOMRI, 2025).**

The data from this table reveal that only 3.5% of learners express complete satisfaction with teacher interaction during distance learning, suggesting a lack of the engagement typically found in face-to-face settings. Meanwhile, between 20.8% and 37.6% report moderate satisfaction, indicating that while some interaction occurs, it may not fully meet learners' needs. In contrast, 14.1% express dissatisfaction, highlighting a significant disconnect between students and educators in online environments. This gap underscores the necessity to strengthen e-presence—the teacher's visibility and responsiveness in virtual settings. As M. G. Moore (1993, p. 22) emphasized in his

theory of transactional distance, meaningful interaction is essential to reduce the psychological and communicational gap inherent in distance education. Enhancing this aspect through personalized feedback, regular check-ins, and opportunities for real-time dialogue can significantly improve learner engagement and satisfaction.

### 5.3 Barriers related to distance learning

The data indicate that only a small percentage of learners, 3.5%, express complete satisfaction with the level of interaction they experience with teachers during distance learning. This suggests that the majority of students perceive their online learning as lacking the depth of engagement and communication typical of traditional face-to-face settings. Between 20.8% and 37.6% of learners report moderate satisfaction with interaction, showing that while some interaction exists, it may not fully satisfy their expectations for meaningful learning experiences. This mixed outcome highlights that many students feel only somewhat engaged, but overall satisfaction remains suboptimal.

Conversely, 14.1% of learners express dissatisfaction with interaction levels, pointing to a significant portion feeling disconnected or disengaged from the virtual learning environment. Such a gap is concerning because effective teacher-student interaction is essential to fostering a productive and collaborative learning atmosphere.

These findings underscore the need to strengthen both e-presence and co-presence in online education. Educators should actively engage learners not only through content delivery but also by providing personalized feedback, stimulating discussion, and promoting collaborative opportunities. Enhancing e-presence—making teachers feel more present and accessible digitally—can improve students' sense of connection and motivation. Likewise, fostering co-presence, where teachers and students engage synchronously and collaboratively, increases interactivity and makes the learning environment more dynamic and supportive. As G. D. Garrison, T. Anderson, and W. Archer (2000, p. 89) explain in their Community of Inquiry framework, social presence and teaching presence are fundamental components of effective online learning.

Addressing these interaction gaps is therefore vital for improving both the effectiveness and satisfaction of distance learning experiences.

## 6. Recommendations

Based on the analysis and findings, the following recommendations aim to improve the implementation of distance education and enhance learners' experiences:

- **Improve Internet Access and Connectivity**

One of the most One of the most significant challenges reported by learners is poor internet connectivity. Educational institutions should collaborate with local governments and telecommunications providers to ensure affordable and reliable internet access, especially in rural areas, facilitating smoother participation in online courses. As noted by J. A. Van Dijk (2006, p. 125), reducing digital inequality is essential to guarantee equitable access to education.

- **Enhance Teacher Training in Digital Pedagogy**

Teachers must be equipped with the digital skills and knowledge required to effectively utilize online tools and platforms. Regular professional development programs focused on ICT integration should be organized to support educators in adopting innovative digital teaching methods. T. Tondeur et al. (2012, p. 68) emphasize that sustained professional development is crucial for teachers to embrace digital practices successfully.

- **Ensure High-Quality Online Content**

It is vital to create engaging, interactive, and well-structured online courses. Utilizing multimedia tools such as video capsules, interactive platforms, and digital media can significantly improve comprehension and student engagement. Teachers should be encouraged to explore diverse multimedia resources to enhance the learning experience. According to R. C. Clark and R. E. Mayer (2016, p. 45), well-designed multimedia instruction leads to deeper understanding and improved retention.

- **Foster More Interaction and Communication**

A recurring concern among learners is the lack of sufficient interaction with instructors and peers. Institutions should prioritize developing platforms that support synchronous and asynchronous communication. Increasing opportunities for teacher-student and student-student interaction via forums, live sessions, and group discussions can build a learning community and boost engagement. M. G. Moore (1989, p. 75) highlights the importance of learner–instructor and learner–learner interaction in maintaining satisfaction and engagement in distance education.

- **Increase Learner Support Systems**

Learners expressed varying satisfaction levels regarding support during distance learning. Institutions should establish comprehensive support structures including tutoring, mentorship, and technical assistance to help students overcome challenges related to online learning tools and resources. Simpson (2013, p. 92) argues that effective learner support is critical to reducing dropout rates and improving academic success in online education.

- **Address the Cost of Technology**

Affordability of technology remains a major barrier for some learners. Educational institutions and governments should explore subsidies or affordable access programs for essential technologies such as laptops, tablets, and reliable internet services. Financial assistance initiatives could support students facing economic constraints in acquiring digital tools. M. Warschauer (2004, p. 33) stresses that access to both infrastructure and digital literacy resources is necessary to bridge the educational digital divide.

## Conclusion

This study adopted a descriptive and exploratory approach to investigate learners' perceptions and satisfaction with distance education. A quantitative survey was conducted using a structured questionnaire distributed electronically to university and high school students from public institutions in Morocco. The questionnaire was disseminated through platforms such as Facebook and WhatsApp, allowing broad outreach, although limitations related to sampling control and the relatively modest sample size must be acknowledged.

Despite these methodological constraints, the research provides valuable insights into students' e-learning experiences. Analysis of responses—presented through tables and graphs—revealed a generally mixed sentiment: while educators made considerable efforts to adapt to remote teaching and motivate learners, many students reported partial dissatisfaction. Key challenges included inadequate internet access and the high costs associated with online education, reflecting findings in prior studies highlighting the digital divide in low- and middle-income contexts (J. A. Van Dijk, 2006, p. 125; M. Warschauer, 2004, p. 33).

Nonetheless, distance education remains a promising and viable complement to traditional classroom instruction. It is particularly valued for its capacity to widen educational access and reduce overall training costs (E. Deming et al., 2015, p. 28; A. Bowen, 2012, p. 54). However, its

long-term success depends on concrete improvements in infrastructure, affordability, and equitable access. Beyond technical issues, learners stressed the importance of enhancing interaction quality and support within online environments—findings consistent with research on learner engagement and digital pedagogy (M. G. Moore, 1989, p. 75; L. Bernard et al., 2009, p. 118).

In conclusion, while learners acknowledge the potential benefits of distance learning, addressing its current limitations is essential to improving satisfaction and educational outcomes. This study lays the groundwork for future reforms in distance education policies and instructional design, ultimately contributing to more resilient and inclusive digital learning ecosystems.

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