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Exploring Perspectives and Practices in Online Education in Morocco: Assessment, Attitudes and Teachers' Preparedness

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Abstract:

The COVID-19 pandemic prompted an unprecedented global shift towards online education, affecting over a billion students worldwide. In response, governments turned to digital platforms to ensure uninterrupted learning. Moroccan educators, too, navigated this transition, employing various technological tools to design and deliver virtual classes. This study aims to support future research, improve educational practices, and inform policy decisions by offering valuable insights into online education in Morocco. It also investigates the adaptive strategies used by Moroccan teachers during the COVID-19 outbreak, focusing on their pedagogical approaches and innovations in online instruction. Drawing from the theoretical framework of Online Collaborative Learning (OCL), data was collected through an online survey questionnaire administered to 842 teachers across different regions of Morocco. Statistical Package for Social Sciences (SPSS) software was utilized for data analysis. The results illuminate the diverse strategies teachers employ to engage students in the virtual classroom, shedding light on effective practices that emerged amidst the challenges posed by the pandemic. This paper contributes valuable insights into the dynamic landscape of online education in Morocco, highlighting the innovative approaches adopted by educators during the pandemic.

Keywords:

Online Learning;
Distance Teaching and Learning;
Teacher Preparedness;
Online Assessment;
Student Engagement;
Moroccan Teachers.

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By understanding and documenting these strategies, educational stakeholders, policymakers, and future digital learning initiatives can better support and enhance online teaching practices for future academic challenges.

探索摩洛哥在线教育的观点和实践：评估、态度和教师的准备情况

摘要：

新冠疫情促使全球教育发生前所未有的转变，影响了全球超过十亿的学生。作为回应，各国政府转向数字平台以确保学习不中断。摩洛哥的教育工作者也在这一过渡中，利用各种技术工具设计和提供虚拟课程。本研究旨在通过提供关于摩洛哥在线教育的宝贵见解来支持未来的研究、改进教育实践并为政策决策提供信息。它还调查了摩洛哥教师在COVID19疫情期间使用的适应性策略，重点关注他们在在线教学中的教学方法和创新。根据在线协作学习（OCL）的理论框架，通过在线问卷调查收集了来自摩洛哥不同地区的842名教师的数据。统计软件包（SPSS）被用于数据分析。结果揭示了教师在虚拟课堂中采用的多种策略，以吸引学生参与，阐明了在疫情带来的挑战中出现的有效实践。本文为摩洛哥在线教育的动态格局提供了宝贵的见解，突出了教育工作者在疫情期间采用的创新方法。通过理解和记录这些策略，教育利益相关者、政策制定者和未来的数字学习计划可以更好地支持和提升在线教学实践，以应对未来的学术挑战。

关键词：协作学习、远程教学/学习、摩洛哥教育工作者。

1. Introduction

The rapid digitalization of education accelerated sharply by the COVID-19 pandemic has established online and hybrid modalities as enduring features of contemporary schooling systems. Beyond emergency remote teaching, higher education institutions worldwide are now consolidating digital practices into mainstream provision, foregrounding persistent questions about instructional quality, equitable access, and scalable assessment. These questions are particularly salient in contexts undergoing parallel reforms to align with twenty-first-century competency frameworks and labour-market demands.

Within this global shift, three interdependent dimensions determine the effectiveness of online education: assessment practices that validly and reliably evidence learning, stakeholders' attitudes that condition adoption and sustained engagement, and teachers' preparedness to enact digital pedagogy at scale. Assessment sits at the core of the learning process, guiding instructional decisions and programme improvement [1-3]. Yet in online settings, long-standing challenges authenticity, academic integrity,

alignment between outcomes and tasks, and feedback timeliness are amplified [4]. Understanding how educators navigate these tensions is therefore central to strengthening online provision beyond the crisis moment.

Morocco provides a compelling case. The system has invested in connectivity and platform adoption while seeking to raise instructional quality and student success in diverse institutional and regional conditions. However, despite accumulating descriptive accounts of technology uptake, the empirical literature remains fragmented in three respects. First, studies often privilege access and infrastructure, offering limited evidence on the assessment strategies actually used online and their perceived efficacy. Second, stakeholder attitudes particularly how teachers and learners perceive the benefits and limitations of online modes are under-examined as mechanisms that enable or constrain implementation. Third, there is scant system-level evidence on teacher preparedness including pedagogical, technological, and assessment competencies anchored in a coherent theoretical lens such as Online Collaborative Learning (OCL), which emphasises knowledge building through structured interaction.

Addressing these gaps, this study applies the OCL framework to analyse Moroccan educators' experiences with online teaching. We draw on a national survey of teachers to estimate the perceived benefits of online learning for students and examine teachers' preparedness for online instruction, while also documenting the assessment approaches adopted in practice. The analysis is designed to generate actionable insights for policy and institutional development, moving from descriptive accounts toward a more integrated understanding of pedagogy, assessment, and capacity.

Accordingly, the study addresses the following research questions:

RQ1: To what extent do Moroccan students benefit from online education?

RQ2: To what extent are Moroccan teachers prepared for online modes of teaching?

By situating Morocco within the broader post-pandemic transformation of higher education and by foregrounding assessment as a linchpin of online quality, the study contributes system-level evidence that can inform professional development, assessment policy, and the design of sustainable online and blended models.

2. Literature Review

The abrupt migration to online instruction during the COVID-19 emergency exposed persistent structural and pedagogical constraints while also catalysing innovation. Across contexts, studies converge on three interlocking determinants of online learning quality: infrastructural readiness, the nature of pedagogical enactment especially interaction and assessment and stakeholder attitudes and capacities. Yet the empirical record remains uneven, and findings on effectiveness are mixed, owing in part to methodological limitations and context-specific constraints.

A consistent theme in the literature is the foundational role of institutional infrastructure reliable connectivity, devices, and platform support in enabling participation and continuity of learning. Weak infrastructure restricts learners' access, depresses engagement, and widens pre-existing inequities [5-6]. Several reports identify internet bandwidth, device sharing within households, and the affordability of data plans as primary impediments to sustained participation [7-8; 12]. While such constraints are often documented descriptively, fewer studies quantify their differential effects across regions or institutional types, limiting external validity and the ability to prioritise policy responses.

Beyond access, concerns centre on the integrity and design of learning activities online. Evidence frequently cites reduced teacher-student interaction, limited peer collaboration, and challenges to authentic assessment as drivers of lower comprehension and weaker academic performance [9-10]. Studies emphasise that assessment

tasks were not always aligned with intended outcomes, feedback cycles were delayed, and academic integrity safeguards were inconsistently implemented, especially under emergency conditions [11]. At the same time, some work notes the enabling role of digital tools—discussion forums, breakout rooms, and automated quizzes in supporting monitoring and formative feedback, albeit to uneven effect when connectivity is unstable [12]. The heterogeneity of outcomes across courses and institutions suggests that how online pedagogy is enacted, particularly in assessment design and interactional routines, is at least as consequential as access itself.

Stakeholder dispositions shape adoption and persistence. Studies underscore that students' attitudes toward online learning ranging from opportunistic engagement with new tools to surface, compliance-oriented participation mediate learning quality [13]. Divergent viewpoints persist: some argue online learning was ineffective or poorly implemented, attributing shortcomings to unsuitable internet facilities, teachers' limited digital pedagogy, and weak parental cooperation; others acknowledge its necessity for continuity yet question efficiency due to the high costs of data packages and platforms, which undermined attainment of learning outcomes [13]. These tensions reinforce the need to move beyond binary judgments of "effective/ineffective" toward analyses that link specific practices and enabling conditions to observed outcomes.

A recurring finding is that technology adoption does not translate into meaningful learning without commensurate pedagogical redesign and support. Teachers report difficulties mastering new platforms, orchestrating interaction online, and ensuring that learning remains purposeful rather than perfunctory. The literature highlights the importance of mindset shifts, deliberate lesson planning, and structured guidance for navigating disruptive change. However, many studies treat "preparedness" as a singular construct, rarely disaggregating technological, pedagogical, and assessment competencies or examining the institutional mechanisms training, mentoring, time allowances that sustain them over time. Moreover, implementation effectiveness depends on design and financing choices that determine the availability of scalable solutions, instructional support, and student services [13].

Taken together, prior work illuminates constraints (infrastructure, affordability), process challenges (interaction, assessment integrity), and human factors (attitudes, preparedness). Yet three gaps remain salient for Morocco. First, the literature privileges access metrics while providing limited, systematic evidence on the assessment strategies actually enacted online and their perceived validity, fairness, and feedback value [12-13]. Second, while attitudes are acknowledged, there is a paucity of system-level measures that relate

teachers' and students' perceptions to concrete pedagogical practices and contextual constraints. Third, teacher preparedness is under-specified: existing studies seldom differentiate among technological, pedagogical, and assessment competencies or link these to institutional supports and resource configurations [10–13]. Addressing these gaps requires a theoretically anchored approach that integrates interaction, collaboration, and assessment as co-determining features of learning online.

Guided by these observations, the current investigation adopts the Online Collaborative Learning lens to examine three linked constructs in Morocco: perceived student benefits from online learning, teacher preparedness disaggregated into technological, pedagogical, and assessment domains, and enacted assessment approaches and their perceived effectiveness. To generate system-relevant evidence rather than isolated case descriptions, we employ a national teacher survey and analyse responses using statistical techniques suitable for exploring patterns across institutional and regional contexts. The Methodology section that follows details the sampling strategy, instrument development aligned with the above constructs, operational definitions, and the analytic procedures used to interrogate these research questions.

3. Methodology

This study aims to comprehensively assess the efficacy and readiness of online education within the Moroccan educational context. Specifically, it aims to investigate the extent to which Moroccan students benefit from online education and evaluate Moroccan teachers' preparedness for engaging in online teaching modalities. This research seeks to provide actionable insights to enhance the implementation and effectiveness of online education initiatives in Morocco through a multi-dimensional analysis encompassing pedagogical, technological, and socio-economic factors. This research adopted the quantitative method through several data collection tools, using Google Forms survey questionnaire, which was distributed to the participants through Emails, Facebook and WhatsApp groups using the snowball sampling technique, allowing participants to refer the survey to colleagues and ensuring a broader reach. The population targeted were Moroccan teachers working in public and private schools dispersed across twelve administrative regions all over Morocco. The participants' number reached 982, grouped as 549 females and 433 males.

The Technology Adoption Model (TAM) has been widely used in studies on technology adoption. This concept was first presented by Davis (1989) to explain a potential user's behavioral intention to use a technological advancement. The theory of reasoned action (TRA) is the foundation for the Technology

Adoption/Acceptance Model (TAM). In addition to the theory of planned behavior (TPB), this psychological theory aims to explain behavior. This cognitive theory focuses on people's attitudes and beliefs to explain behavior.

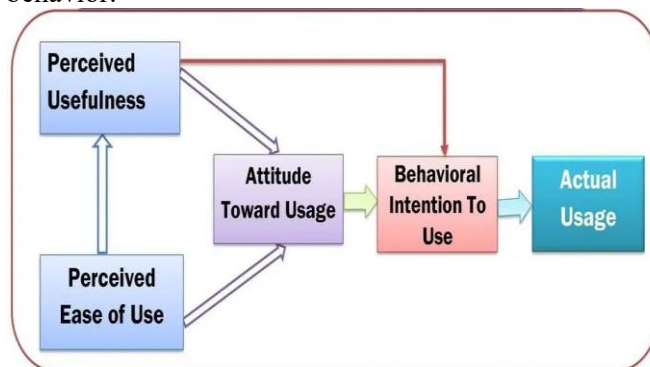


Figure 1. Technology Acceptance Model [3]

Perceived utility (PU) and perceived ease of use (PEU), two main predictors of TAM that originated with Bandura's Self-Efficacy Theory (1982), were used. "The degree to which a person believes that using a particular system would enhance his/her job performance" is how Davis [3] defines the first determinant, perceived usefulness. "The degree to which a person believes that using a particular system would be free of physical and mental effort" is how he defines the second determinant, perceived utility (PEU) [3]. Furthermore, according to Davies [3], the existence of these two ideas affects the development of favorable or unfavorable opinions on a particular technological instrument. Positive attitudes influence its acceptance, while negative ones influence its rejection.

The Technology Acceptance Model (TAM) provides a theoretical lens through which we can understand Moroccan teachers' readiness to adopt online teaching methods. This study utilizes TAM to explore the usefulness and ease of use of online teaching tools among Moroccan teachers. By leveraging quantitative data collection methods, the study aims to provide empirical evidence regarding the factors influencing teachers' acceptance of online education in Morocco. For this study, TAM assesses how Moroccan teachers perceive online education as beneficial for their teaching practices and students' learning outcomes. It measures perceived usefulness through survey questions that ask teachers to rate the extent to which they believe online education enhances teaching effectiveness, student engagement, and learning outcomes.

TAM also measures the perceived ease of use for Moroccan teachers. Mainly, questions in the survey focused on teachers' experiences with using online teaching technologies, their comfort level with navigating online platforms, and any challenges they encountered in integrating online education into their teaching practices. In addition to that, TAM suggests that perceived usefulness and ease of use influence

users' overall attitude towards adopting a new technology. In this study, we explored Moroccan teachers' attitudes towards online education by asking them to rate their agreement or disagreement with statements about the value and feasibility of incorporating online teaching modalities into their classes. In this paper, TAM helped us gain valuable insights into Moroccan teachers' perceptions, attitudes, and behaviors related to online education. This can eventually inform strategies for enhancing the implementation and effectiveness of online education initiatives in Morocco.

3.1. Instruments

We designed and administered a detailed survey using Google Forms, divided into five sections. The initial part gathered demographic information, followed by sections focusing on online teaching characteristics, challenges faced by educators, students, and class quality, and finally, teachers' perceptions, experiences, and training. Our study involved 982 teachers and professors across various Moroccan educational institutions.

3.2. Participants

The study sample comprised Moroccan teachers and professors from both government and private educational institutions, who were contacted through various Facebook and WhatsApp groups dedicated to educators. A total of 982 participants, including school teachers and university professors, completed the survey questionnaire. Among the respondents, 44.1% were male, and 55.9% were female, with ages ranging between 20 and 40 years old.

4. Results and Discussion

In the wake of global challenges such as the COVID-19 pandemic, adopting online education has become essential to ensure continuous learning opportunities for students worldwide. Morocco, like many other countries, has witnessed a rapid transition towards online teaching modalities to mitigate the impact of disruptions on educational continuity. This part presents the findings of this comprehensive study aimed at investigating the efficacy of online education for Moroccan students and evaluating the preparedness of Moroccan teachers to engage in online teaching. This paper studies the efficacy of online education and teacher preparedness through determinant variables such as gender, age, and place of work.

4.1. Research Question 1:

- To what extent do Moroccan students benefit from online education?

4.1.2 Participants by Gender

Gender can influence various aspects of education, including learning preferences, teaching styles, and resource access. Research has shown that males and females may prefer learning environments and teaching methods differently. Understanding how gender impacts engagement with online education and teaching practices can help educators design more inclusive and compelling learning experiences.

The gender distribution among respondents in the survey represents a total of 982 participants. Among them, 55.9% are females, while 44.1% identified as male. Notably, females constituted the majority of respondents, representing 55.9%, whereas males accounted for 44.1% of the total respondents, as shown in Table 1 and Figure 2.

Table 1. Distribution of participants based on gender factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Female	549	55.9	55.9	55.9
	Male	433	44.1	44.1	100.0
	Total	982	100.0	100.0	

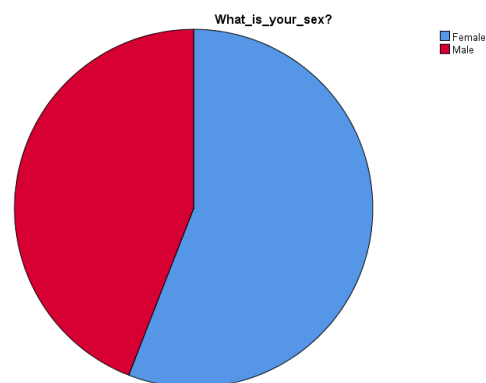


Figure 2. Distribution of participants based on gender factor

4.1.2. Participants by Age

Age can influence technology proficiency, adaptability to change, and teaching experience. Older teachers, for instance, may have more experience but might need help in adopting new technologies compared to younger counterparts. Younger teachers, on the other hand, maybe more familiar with digital tools but may lack pedagogical experience. Examining how different age groups navigate online education and prepare for teaching in virtual environments can provide insights into training needs and strategies for professional development.

Table 2. Distribution of participants based on age factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	20_30	442	45.0	45.0	45.0
	30_40	367	37.4	37.4	82.4
	40_60	173	17.6	17.6	100.0
	Total	982	100.0	100.0	

The data provided sheds light on the age distribution of Moroccan teachers surveyed. Among the 982 teachers, the majority, comprising 45%, fell within the age range of 20-30 years. Following closely were teachers aged 30-40, constituting 37.4% of the respondents. A smaller proportion, 17.6%, belonged to the age group of 40-60. This distribution indicates a significant presence of younger teachers in the surveyed population, possibly reflecting the demographic composition of the teaching profession in Morocco. Understanding the age demographics of teachers during the lockdown period is crucial for discerning potential differences in experiences, perspectives, and responses to the challenges posed by the pandemic within the educational context.

4.1.3. Participants by Place of Work

Place of work is an essential variable for this study. The participants of this investigation were teaching in different parts of Morocco, as the table shows. The geographical location of a teacher's workplace can impact access to resources, infrastructure, and support systems. Teachers in urban areas may have better access to high-speed internet and professional development opportunities compared to those in rural or remote locations. Additionally, the cultural and socio-economic context of the workplace can influence teaching practices and student demographics. Understanding how the place of work affects online education and teacher preparedness can help identify disparities and inform efforts to address educational inequalities.

Table 3. Distribution of participants based on place of work factor

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rural Area	224	22.8	22.8	22.8
	Urban Area	758	77.2	77.2	100.0
	Total	982	100.0	100.0	

The table presents data on the distribution of respondents' workplaces, categorized into rural and urban areas. It is evident in the numbers showcased above that the majority of teachers (77.2%) worked in urban areas, indicating a higher concentration of educators in urban settings. On the other hand, a smaller

portion (22.8%) worked in rural areas, suggesting a comparatively lower presence of educators in rural regions of Morocco. This distribution reflects the broader demographic trends of population concentration in urban areas and highlights potential disparities in access to educational resources and opportunities between urban and rural settings. The data here underscores the importance of considering geographical factors in educational planning and resource allocation to ensure equitable access to quality education across different regions of Morocco.

4.1.4. Assessing the Efficacy of Online Education for Moroccan Students

In this part, the focus is on how beneficial online education is for Moroccan students. The analysis is based on some of the questions used in the survey.

Table 4. Teachers' Opinions on Students' Commitment

In your opinion, how committed were your students to attending online classes?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Not committed	507	51.6	51.6	51.6
	Somewhat committed	451	45.9	45.9	97.6
	Very Committed	24	2.4	2.4	100.0
	Total	982	100.0	100.0	

The table reveals a spectrum of commitment levels among Moroccan students towards attending online classes during the COVID lockdown, as perceived by their teachers. Notably, over half of the teachers (51.6%) observed that their students were not committed to attending online classes. This suggests a prevalent challenge where a significant portion of students may have struggled to engage with remote learning for various reasons, such as limited access to resources or difficulties adjusting to the online format. Conversely, nearly half of the teachers (45.9%) reported that their students were somewhat committed to attending online classes. This indicates that while many students faced obstacles or exhibited varying levels of engagement, a substantial proportion still demonstrated some degree of commitment to participating in virtual learning activities. These students may have shown efforts to stay connected with their studies despite the challenges posed by the transition to online education. However, some teachers (2.4%) perceived their students as very committed to attending online classes. This small but noteworthy group of students exhibited high levels of dedication and enthusiasm towards remote learning, actively participating in virtual classes and making the most out of available resources. Their

commitment likely contributed to a more positive learning experience and outcomes amidst the uncertainties of the COVID lockdown.

Table 5. Teachers' Opinions on the Interaction with their Students

Do you find it easy to interact with students while teaching online?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	732	74.5	74.5	74.5
	Uncertain	162	16.5	16.5	91.0
	Yes	88	9.0	9.0	100.0
	Total	982	100.0	100.0	

The table presents Moroccan teachers' perspectives on the ease of interacting with students while teaching online during the COVID lockdown. Most respondents, comprising 74.5% of teachers, indicated that they did not find it easy to interact with students in the virtual learning environment. This suggests widespread challenges educators face in effectively engaging with their students online, possibly due to technological limitations, lack of face-to-face interaction, or difficulties maintaining student attention. Approximately 16.5% of teachers expressed uncertainty about their ease of interaction, reflecting mixed experiences and perceptions. In contrast, a smaller proportion (9%) reported finding it easy to interact with students online, suggesting successful adaptation to the virtual teaching landscape. These findings highlight Moroccan teachers' varying degrees of comfort and effectiveness in fostering interactions with students during remote learning, emphasizing the importance of addressing challenges and providing support to enhance online teaching practices.

In addition to that, teachers were asked about students' social background and how it interferes with students' access to online education. In the table below, teachers expressed interesting points of view.

Table 6. Teachers' Ability to Satisfy Students' Needs

I am able to satisfy my students questions during online classes					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	211	21.5	21.5	21.5
	Often	370	37.7	37.7	59.2
	Rarely	47	4.8	4.8	64.0
	Sometimes	354	36.0	36.0	100.0
	Total	982	100.0	100.0	

The data from the table above reveals a prevailing concern among teachers regarding the affordability of online learning platforms for students from diverse socio-economic backgrounds. A significant majority (81.2%) believed that students across different economic strata needed help to access learning through online platforms. This sentiment reflects apprehensions

about the accessibility and financial constraints economically disadvantaged students face in accessing online education. Additionally, a smaller portion (9.5%) remained uncertain about the affordability aspect, possibly indicating a lack of clarity or varying perspectives on the issue. Conversely, a minority (9.4%) believed that students from different socio-economic backgrounds can afford online learning. While this group exists, its size suggests that the prevailing sentiment leans toward concerns about accessibility and affordability. Eventually, the data underscores the need to address access barriers and ensure equitable opportunities for all Moroccan students, irrespective of their socio-economic circumstances.

4.2. Research Question 2:

-To what extent are Moroccan teachers prepared for the online mode of teaching?

Table 7. Online Class Achievement Overview

Do you think you can assess students' achievement or failure through online classes?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	663	67.5	67.5	67.5
	Uncertain	187	19.0	19.0	86.6
	Yes	132	13.4	13.4	100.0
	Total	982	100.0	100.0	

An analysis of the results above shows varied viewpoints regarding the assessment of Moroccan students' achievement or failure through online classes. A substantial majority of teachers (67.5%) expressed doubts about the capability of online learning environments to gauge student performance accurately. This skepticism suggests apprehensions about the reliability and validity of online assessment methods compared to traditional face-to-face evaluations. Furthermore, a significant portion (19.0%) remained uncertain, indicating a lack of consensus or confidence in the efficacy of online assessment tools. However, a smaller yet noteworthy segment (13.4%) believed in the feasibility of assessing student achievement or failure through online platforms, potentially reflecting a degree of trust in the adaptability and effectiveness of online assessment techniques.

Table 8. Meeting Daily Lesson Objectives in Online Classes

I am able to fulfill daily lesson objectives during online classes.					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Always	60	6.1	6.1	6.1
	Often	250	25.5	25.5	31.6
	Rarely	317	32.3	32.3	63.8
	Sometimes	355	36.2	36.2	100.0
	Total	982	100.0	100.0	

The table provides insights into educators' perceptions of their ability to fulfill daily lesson objectives during online classes. Clearly, the data reveals that the majority of respondents (36.2%) reported fulfilling lesson objectives sometimes, indicating a mixed level of success in achieving daily teaching goals. Notably, a significant proportion (32.3%) reported rarely being able to fulfill these objectives, suggesting challenges or obstacles encountered during online instruction. Conversely, a smaller percentage (25.5%) mentioned often fulfilling lesson objectives, indicating a degree of success in meeting teaching goals. A minority (6.1%) reported consistently fulfilling daily lesson objectives, highlighting a small but consistent group of educators who feel confident in consistently achieving their teaching objectives during online classes.

Table 9. Online vs. Face-to-Face Teaching: Future Perspectives

Do you think that in future online teaching should replace face to face teaching?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	816	83.1	83.1	83.1
	Uncertain	112	11.4	11.4	94.5
	Yes	54	5.5	5.5	100.0
	Total	982	100.0	100.0	

A look at the table above suggests that a significant majority of respondents (83.1%) disagreed with the idea of online teaching replacing face-to-face instruction, indicating a preference for traditional in-person teaching methods. This suggests that most respondents believe in face-to-face interaction's unique value and effectiveness in education. Additionally, a notable portion (11.4%) remained uncertain whether online teaching should replace face-to-face teaching, suggesting a lack of consensus or clarity. Conversely, a small percentage (5.5%) agreed that online teaching should replace face-to-face instruction, highlighting a minority viewpoint that sees potential benefits in transitioning to online learning formats.

Table 10. Preparedness for Online Instruction

Do you think that you are trained and prepared for conducting online classes?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	515	52.4	52.4	52.4
	Uncertain	146	14.9	14.9	67.3
	Yes	321	32.7	32.7	100.0
	Total	982	100.0	100.0	

A notable portion of respondents (52.4%) feel they need to be trained and prepared for conducting online classes, as shown in the table above. This suggests a significant gap in training and preparation for online teaching among Moroccan educators, potentially leading to challenges in effectively transitioning to digital learning environments. Additionally, a considerable percentage (14.9%) remained uncertain about their preparedness, indicating a lack of confidence or clarity on the matter. This uncertainty could stem from factors such as insufficient training opportunities, limited experience with online teaching tools, or uncertainty about best practices in online instruction. Conversely, a minority (32.7%) expressed confidence in their training and preparation for conducting online classes, highlighting a segment of Moroccan educators who feel adequately equipped to navigate the challenges of online teaching.

Table 11. Support from School Administration for Transition to Online Classes

Have you received any help from your school administration to transition from face-to-face to online classes?					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	721	73.4	73.4	73.4
	Yes	261	26.6	26.6	100.0
	Total	982	100.0	100.0	

A significant majority of Moroccan teachers (73.4%) reported not receiving any help from their school administration in transitioning to online classes. This suggests a need for more support or resources provided by school leadership, potentially leading to challenges for educators adapting to online teaching environments. Moreover, a minority (26.6%) indicated that they did receive assistance from their school administration, highlighting a segment of educators who benefited from support or guidance in navigating the transition to online instruction. The present findings indicate widespread shortfalls in institutional support for Moroccan teachers during the transition from face-to-face to online instruction. The fact that a substantial majority reported limited or no administrative backing is consistent with implementation challenges commonly associated with rapid modality shifts namely, constrained resource allocation, weak communication and coordination, and insufficient opportunities for targeted professional learning. This pattern accords with prior evidence from Morocco documenting that teachers faced significant obstacles when initiating online teaching, including inadequate training for virtual delivery and recurrent technical problems that undermined instructional effectiveness. Taken together, these results suggest that system-level interventions should prioritize predictable access to platforms, devices, and connectivity; structured professional

development on digital pedagogy and assessment (with protected time and follow-up coaching); and clear communication channels and help-desk support to resolve technical issues in real time. At the policy level, the Ministry of Education should review support mechanisms against these pillars, align budget allocations accordingly, and institute monitoring and feedback loops to track teacher preparedness and course delivery quality over time. Strengthening these enablers is likely to increase teachers' implementation fidelity and self-efficacy, thereby improving the quality and continuity of online learning.

5. Conclusion

This study provides an integrated view of online education in Morocco by jointly examining perceived student benefits, teachers' readiness for digital pedagogy, and the assessment practices enacted during the transition to remote instruction. The evidence indicates that perceived learning gains are contingent on a set of interdependent conditions: dependable access to platforms and connectivity, explicit pedagogical redesign for online interaction, and assessment approaches that deliver timely, actionable feedback. Teachers' preparedness emerged as uneven across technological, pedagogical, and assessment domains, and reports of limited institutional backing were common. These patterns are broadly consistent with international findings that emphasise infrastructure constraints, attenuated interaction, and gaps in professional learning as primary obstacles to effectiveness [5–14]. Beyond documenting access issues, the study adds system-level evidence on how assessment was implemented online and how teacher preparedness relates to perceived student benefit. By disaggregating preparedness into distinct competency areas and situating practice within a collaborative learning framework, the analysis moves the debate from whether online learning “works” to which configurations of resources, support, and pedagogy are associated with better outcomes. The results constitute a baseline for monitoring the quality of online and blended provision as digitalisation continues.

Institutions and policymakers should prioritise a coordinated bundle of supports: reliable connectivity and device access for teachers and students; structured professional development focused on online interaction and assessment (with protected time for course redesign and iterative coaching); clear protocols and tools for formative feedback and academic integrity; and responsive technical and administrative help desks to reduce downtime and uncertainty. Embedding these elements within institutional quality assurance through routine monitoring of teacher preparedness and student experience would enable adaptive improvement rather than one-off interventions.

6. Limitations and Recommendations for Practice

While the research findings provide valuable insights into the experiences of Moroccan students and teachers during the COVID lockdown, it is essential to recognize the inherent limitations of relying solely on teachers' perceptions. These perceptions may be influenced by individual biases, experiences, and circumstances, potentially impacting the accuracy and comprehensiveness of the data. Moreover, the absence of longitudinal data restricts our ability to assess changes and trends in online education practices over time, limiting the depth of our understanding. A multifaceted approach is warranted to address these limitations and facilitate meaningful improvements in online education. Firstly, investing in comprehensive and ongoing teacher training programs is essential to equip educators with the pedagogical skills, technological proficiency, and adaptability required for effective online instruction. School administrations must proactively provide support, resources, and professional development opportunities to empower teachers in navigating the challenges of digital learning environments.

Additionally, concerted efforts should be made to ensure the affordability and accessibility of online platforms for students from diverse socio-economic backgrounds. This may involve partnerships with governmental agencies, NGOs, and technology providers to offer subsidized or free access to essential digital resources and devices. Furthermore, exploring hybrid teaching models that integrate online and face-to-face instruction can offer a flexible and inclusive approach to education, catering to learners' diverse needs and preferences. Continuous evaluation and feedback mechanisms involving teachers and students are paramount for assessing the effectiveness of online teaching practices and identifying areas for improvement. By implementing these recommendations, Morocco can foster a more equitable, resilient, and student-centered approach to online education, ensuring that all learners have access to quality learning opportunities, regardless of their circumstances.

Author Contributions

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Data Availability Statement

Data are available on reasonable request from the corresponding author. The dataset contains potentially identifying information and is subject to privacy and institutional restrictions; therefore, it is not publicly available. A de-identified codebook and survey instrument can be shared upon request.

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Conflicts of Interest

The authors declare no conflict of interest.

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