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Remote Learning in Higher Education in Morocco after COVID-19: Lessons (un)learned

Prof. Rachid EL AASRI
Depart. Ingénierie des Compétences, Management et Communication (ICMC)
Lab. Computer Science, Artificial Intelligence and Cyber Security (2IACS), ENSET,
Hassan II University of Casablanca, Morocco
0000-0001-6456-9237),
Prof. Abdelmajid BOUZIANE
Hassan II University of Casablanca, Morocco
0000-0002-4138-2450

Abstract

This study explores the impact of COVID-19 on remote learning in Moroccan higher education through an in-depth examination of research conducted within the Moroccan context. Guided by the ISTE Seven Essential Conditions Standards as an evaluative framework, the paper analyzes the efficacy of adopted eLearning practices drawn from scholarly journal articles, book chapters, national reports, conference proceedings, and university dissertations. While the research identifies valuable lessons learned, it highlights the persistence of numerous challenges despite their prior recognition before the pandemic. This analysis underscores the importance of prioritizing the resolution of these unresolved challenges to foster an effective integration of eLearning within Moroccan higher education.

Keywords: *Covid-19, Morocco, eLearning, remote learning*

Before the COVID-19 pandemic, technology use in Moroccan higher education was primarily limited to illustrative materials and the use of devices within classrooms. Driven by personal initiatives such as interest or academic exploration, a few lecturers adopted online learning (remote learning, remote learning (remote learning), henceforth) approaches with a particular focus on MOOCs (Riyami & Bouaine, 2020; Idrissi Jouicha et al., 2020, 2021). However, the global epidemic outbreak forced a rapid shift towards remote learning (remote learning) models, disrupting traditional pedagogical approaches. Morocco's higher education institutions, like others worldwide, had to adapt to this new reality. This abrupt transition to

a more complex online environment requiring Technological Pedagogical Content Knowledge (TPACK) presented a significant challenge for all stakeholders. While pre-pandemic use of technologies suffered from infrastructure deficiencies, the pandemic necessitated a swift and large-scale adoption of remote learning (remote learning) platforms and methodologies.

This rapid shift towards remote learning (remote learning) in the Morocco's higher education system presents a unique opportunity to analyze its effectiveness and identify valuable lessons for the future. Through a comprehensive literature review, this study surveys areas where Morocco's higher education system has progressed and those that require further attention from stakeholders, particularly decision-makers. By evaluating these developments against the International Society for Technology in Education (ISTE) seven Essential Conditions, it attempts to answer the following questions: How did this crisis serve as a catalyst for boosting digital transformation (lessons learned)? Which challenges hinder the full potential of remote learning (remote learning) (lessons unlearned)?

The Seven Essential Conditions:

Ones of the most significant contributions to the field of educational technology by ISTE (https://iste.org/) is the development of the Seven Essential Conditions for Effective Tech Use in Schools. These conditions serve as a comprehensive framework for ensuring that technology is used strategically and effectively to enhance learning outcomes. The synthesis summary of these conditions originates from the organization's website:

1. **Shared Vision:** This condition emphasizes the importance of a unified understanding amongst educators, administrators, students, and families regarding the purpose and goals of using technology in education. It ensures everyone is working towards the same objectives.
2. **Implementation Planning**: This condition requires detailed planning, encompassing necessary infrastructure (hardware, software), resources (e.g., professional development), and a clear strategy for ongoing evaluation.
3. **Equitable Access:** This condition revolves around the principle that all students deserve a fair opportunity to benefit from educational technology. It highlights the need to address potential disparities in access to devices, internet connectivity, and technical support, ensuring no student is left behind.
4. **Prepared Educators**: This condition emphasizes the importance of ongoing professional development opportunities that equip teachers with the skills and knowledge to integrate technology confidently and meaningfully into their teaching practices.

5. **Skilled and Sufficient Technical Support:** This condition highlights the need for reliable and readily available technical support for both educators and students.
6. **High-Quality Learning Activities and Content:** This condition denotes the importance of developing engaging, well-designed learning activities and content that are aligned with curriculum goals.
7. **Ongoing Evaluation:** Technology integration is an ongoing process. This condition emphasizes the importance of regularly monitoring and evaluating the effectiveness of technology use in achieving desired learning outcomes. Data gathered through ongoing evaluation provides valuable insights for continuous improvement.

Given the rapid shift to online learning in the Moroccan higher education system due to COVID-19, these ISTE standards provide a valuable framework for analyzing the effectiveness of remote learning (remote learning) practices and identifying areas of improvements.

Methods

This study employed a systematic literature review approach to examine the impact of COVID-19 on remote learning (remote learning) practices within Moroccan higher education. The review focused exclusively on research produced within the Moroccan context, aiming to gain a deeper understanding of the specific experiences and challenges faced by Moroccan institutions.

A comprehensive search was conducted using various academic databases, including specific databases used, e.g., ERIC, EBSCOhost, DOAJ, CSEFRS, Google Scholar etc... Additionally, relevant national reports, conference proceedings, and university dissertations on the Moroccan context were included in the review. The search timeframe encompassed research published between 2020 and 2024 to capture the most recent developments related to remote learning (remote learning) in post-COVID-19.

Studies were selected based on pre-defined inclusion and exclusion criteria. To be included within the scope of this study, studies had to focus on remote learning (remote learning) practices in Moroccan higher education institutions, be published during or after the COVID-19 pandemic (within the specified timeframe), and be written in English, French, or Arabic. Studies not meeting these criteria or lacking a clear focus on remote learning (remote learning) implementation were excluded.

The ISTE Seven Essential Conditions Standards served as the analytical framework for this review. These standards, encompassing Shared Vision, Implementation Planning, Equitable Access, Prepared Educators, Skilled and Sufficient Technical Support, High-Quality Learning Activities and Content, and Ongoing Evaluation, were utilized to evaluate the effectiveness of the reported remote learning (remote learning) practices adopted by Moroccan institutions.

Thematic analysis was employed to identify recurring themes and patterns within the collected research. This process involved systematically reading and coding the data to extract key lessons learned and unlearned regarding the implementation of remote learning (remote learning) during and after the pandemic in Morocco. The extracted themes were then categorized to provide a comprehensive understanding of the impact of COVID-19 on remote learning (remote learning) in the Moroccan higher education context.

Findings

Table 1: The state of the art of ICT use in Morocco after COVID-19

Essential condition	After COVID-19
Shared vision	The outbreak of the pandemic bewildered the stakeholders. Nearly all the subsequent actions were geared towards ensuring learning continuity (Higher Council, 2021) rather than towards quality and policy refinements. All the universities set up platforms, though different, to overcome disruptive classes. The students with no connection benefited from TV and radio programs as alternatives (Kaouni et al, 2021). Most universities have opted for the same open-source LMS, Moodle (Kaouni et al, 2021). Remote teaching was regulated by a Ministerial Decree (2.20.474) that insists on remote teaching being a supplement to brick-and-mortar teaching (Bulletin Officiel, 2020). Surprisingly, the 2024 national pedagogical standards (MoHE, 2024) stipulate that only 30% of each module can be provided online and that final exams must be written and onsite. Generally, the status of distance education in the laws and its ways of implementation in curricula need revisiting to become part of a national strategy (Bouabdallah, 2020).
Impleme ntation planning	The teaching staff used different hardware and software, including email and social media (Bachiri & Sahli, 2020; Elfirdoussi et al., 2020; El Hammoumi & El Yousfi, 2020; El Marhoum et al., 2020; Louiz, 2020a; Rahali et al., 2020; Rechidi &

	Bennani, 2020; Anigri, 2021; Alaoui Mahrez, 2021; Aoun & Kasbaoui, 2021; Benhima, 2021; Benjelloun et al., 2021; Ennam, 2021; Hamdani, 2021a; Hibbi et al., 2021; Jabari et al., 2021; Ouajdouni et al., 2021; Razkane et al., 2021; Sallami & Oukhadjou, 2021; Imouri & El Addouli, 2022; Kaouni et al., 2022; Naciri et al., 2022; Ouajdouni et al., 2022; Safeh & Namir, 2022; Bourray, 2023; Zine-Edine & Maliki, 2023; Blilat et al., 2024; even after COVID when the universities launched their existing platforms (Halimi, 2023). Human resources received fewer investments than the infrastructure. Universities are called to modernize their leadership and management skills (Belhassan & Azegagh, 2021; Daaqili & Bahite, 2022). Hayar et al. (2022) share a success story of a university governance and leadership during the pandemic. Similarly, Aberkane et al. (2022) share the one of another university. Bouziane (2022) share the story of one institution in a Moroccan university. Some funds were granted to do research on the effect of the pandemic on society. More funds are allocated for the design of digital contents for different courses. The public-private partnership has resulted in the creation of a national platform (National Platform of Digitalization and Remote Teaching, www.cnde.ma). The second round of tenders to create high quality contents is in progress. However, tiny incentives are allocated for people's individual initiatives, especially that lecturers declare that designing online courses takes time and incurs expenses (Benkhalouq & Berrada-Hmima, 2021). Institutional emails have been created in universities but they are underused (Benhima, 2021; Safeh & Namri 2021). Different types of digital resources were developed by institutions or individuals in different environments and put at the students' disposal (Draissi & ZhanYong, 2020; Berdi et al., 2021; Elmendili & Saidi, 2020; Elmouhtarim, 2021; Hibbi et al., 2021). There is an absence of counseling and psychological support during the pandemic (Rahali et al., 2020; El Kassimi, 2022), causing moderate to high levels of burnout as the case of teacher training centers (Bouhaba et al., 2022). Araq (2021) claims that counseling is part of a lecturer's duty. The suggestions for inclusive models to serve disabled people are limited (Arattai, 2021; El Fazazi, 2021). Some universities created special teams for counseling (Hayar et al., 2022). Benkhalouq & Berrada-Hmima (2021) share a case of counseling especially disabled learners.
Equitable access (extremely	The survey-based studies published during the pandemic recurrently focus on this issue. Some studies raise no or poor connection and no or obsolete devices (Benkaraache, 2020; Benseddik, 2020; Hantem, 2020; Elfirdoussi et al., 2020; Lajane et al., 2020; Rechidi & Bennani, 2020; Aoun & Kasbaoui, 2021; Benmassoud

	& Bouchara, 2021; El Aouri, 2021; Elatri, 2021; Elqobai & Soussi, 2021; Ismaili & Ouazzani Ibrahimi, 2021; Jabari et al., 2021; Mounjid et al., 2021; Ouahabi et al., 2021; Samlak, 2021; Bachisse & Mouline, 2022; Chaari, 2022; Dani et al, 2022; Felahi & Saqri, 2022; Kaouni et al., 2022; Lakssoumi et al., 2022; Porter et al., 2022; Zouiri and Kinani, 2022; Fahmi, 2023). Importantly, the quality of connection and device is a predictor of satisfaction (Naciri et al., 2022). Students are reported to rely mostly on their mobile phones to connect with their lecturers (Bachiri & Sahli, 2020; Benkaraache, 2020; Elfirdoussi et al., 2020; El Hammoumi & El Yousfi, 2020; El Marhoum et al., 2020; Aoun & Kasbaoui, 2021; Benhima, 2021; El Aouri, 2021; Hamdani, 2021a; El Khalfi, 2021; Ladham et al., 2021; Kaouni et al., 2022; Zouiri & Kinani, 2022; Bourray, 2023; Dehbi et al., 2023; Halimi, 2023; Boukranaa et al., 2024). Interestingly, the phones and tablets are reported to be incompatible with certain types of online activities (Tayoub et al., 2023). Starting from 2023-24, the Ministry of Higher Education has provided SIM cards to students to have free access to the digital workspaces of respective universities.
Prepared educators	There has been a lot of progress in the use of technologies of sharing digital resources and interacting with students using sharing and videoconference apps (Benseddik, 2020). The teaching staff need basic computer skills (Rechidi & Bennani, 2020; Anigri, 2021; Fahmi, 2023) but others are technical savvy (El Aissaoui, 2020). The teaching staff did not have or need training in distance education (Benkaraache et al., 2020; Benseddik, 2020; Bouyzem & Al Meriouh, 2020; Elfirdoussi et al., 2020; Lajane et al., 2020; Rechidi & Bennani, 2020; Ouahabi et al, 2021; Razkane et al., 2021; Sallami & Oukhadjou, 2021; Jebbour, 2022; Lakssoumi et al., 2022; Blilat et al., 2024; Laabidi, 2024). Some teaching staff already had experience in distance teaching (Mounjid et al., 2021; Safeh & Namir, 2022). Teaching staff think the technical support provided by their schools is insufficient (Bouyzem & Al Meriouh, 2020; Lajane et al., 2020; Akhasbi et al., 2021; Safeh & Namir, 2022; Blilat et al., 2024; The teaching staff tend to prefer traditional and hybrid teaching (Baidada, 2020; Benkaraache et al. 2020; Rechidi & Bennani, 2020; Boukil & Benabdouallah, 2021; Mounjid et al., 2021; Samlak, 2021; Souabi et al., 2021; Soufiani, 2021; Razkane et al., 2021; Safeh & Namir, 2022; Ait-Hroch & Ibrahimi, 2023) with focus on flipped classroom (Ksioura et al, 2023). Ammor & Chafiq (2024) devote a book to hybrid teaching with adequate description of how to design a course based on this mode.

	Lecturers showcase and share practices (Baidada, 2020; Chachah, 2020; El Mousadik & Abentak, 2020; Benaddi & Zegar, 2021; Boukil & Benabdouallah, 2021; Elaref & El-Himer, 2021; Elfaqar, 2021; El Fazazi et al., 2021; Fahfouhi & Fathi, 2021; Idrissi Jouicha et al., 2021; Touati, 2021; Elmqaddem & Bahji, 2022; Senihji, 2024). Sakale & Alaoui Hichami (2023) suggest digital citizenship for better use of online resources. The online input was evaluated by the learners who showed a fair degree of satisfaction (Elfirdoussi et al., 2020; Elaref & El-Himer, 2021). Most lecturers didn't assess their students online (Benseddik, 2020; Rechidi & Bennani, 2020; Samlak, 2021; 50% of the students already took traditional and MCQ tests online, though 43% reported they needed technical guidance (Hamzaoui et al., 2024). Lecturers and learners reject online assessment (Elfirdoussi et al., 2020). However, Chachah (2020) and Malmous & El Khaldi (2021) describe cases of e-evaluation. In-service training has become more frequent, yet most of it addresses how to use technology rather than how technology can help pedagogy and get the students more engaged in their learning. Instructor quality has direct effect on system use and learner satisfaction (Ouajdouni et al., 2022). Despite some advances in leadership (see Implementation Planning above), personal initiatives still prevail.
Skilled and sufficient technical support (extremely important)	Guides, videos and other how-to documents are created and put at the disposal of those in need of them (OCP Foundation, 2020). Despite the number of webinars and online coaching provided by many parties, there is still shortage in the techno-pedagogical skills. Despite recruiting technicians, developers and other admin staff to provide technical assistance, the institutional technical assistance has been evaluated insufficient (Benseddik, 2020; El Hammoumi & El Yousfi, 2020; El Marhoum et al., 2020; Aoun & Kasbaoui, 2021; Benhima, 2021; Hamdani, 2021a; Soufiani, 2021; Zouiri & Kinani, 2022; Boukranaa et al., 2024). Many students report the limited or lack of communication among them and with the teaching staff (HCP, 2020; Alaoui Mahrez, 2021; Aoun & Kasbaoui, 2021; Elatri, 2021; Elmouhtarim, 2021; Hamdani, 2021a; Ismaili & Ouazzani Ibrahimi, 2021; Jamai, 2021; Soufiani, 2021; Imouri & El Addouli, 2022; Kaouni et al., 2022; El Malaki & Karoum, 2022; Felahi & Saqri, 2022; Lakssoumi et al., 2022; Fahmi, 2023; Halimi, 2023; Laachir et al., 2023; However, others report a moderate to high degree of satisfaction of interactions with their lecturers (Louiz, 2020b; Akhasbi et

	al, 2021; Belhassan & Azegagh, 2021; Lakssoumi et al., 2022; Bourray, 2023; Boukranaa et al., 2024). Some students report their limited familiarity with basic computer skills that enable them to participate in RL (Rahali et al., 2020; Zouiri et al, 2020; Aoun & Kasbaoui, 2021; Asseraji, 2021; Benhima, 2021; Elmouhtarim, 2021; Belamghari, 2022a; Belamghari, 2022b; whereas others report fair to good knowledge about them (Chemsi et al., 2020; El Marhoum et al., 2020; El Khalfi, 2021; Elqobai & Soussi, 2021; Sebbani et al., 2021; Hanni, 2022; Fahmi, 2023; Zinde-Dine & Maliki, 2023). Students' motivation and use of learning strategies have increased (Benaberrazik & Benhima, 2021). Many students did not learn remotely before the pandemic and thus may not be ready to do so (Rechidi & Bennani, 2020; El Aouri, 2021; Elmouhtarim, 2021; Ismaili & Ouazzani Ibrahimi, 2021; Jabari et al., 2021; Ladham et al., 2021; El Malaki & Karoum, 2022; Hanni, 2022; Lakssoumi et al., 2022;). Most students prefer traditional and hybrid learning to RL (Elfirdoussi et al., 2020; Louiz, 2020b; Rahali et al., 2020; Rechidi & Bennani, 2020; Aoun & Kasbaoui, 2021; Elqobai & Soussi, 2021; Hamdani, 2021a; Jamai, 2021; Ladham et al. 2021; Sallami & Oukhadjou, 2021; Sebbani et al., 2021; Dani et al., 2022; El Malaki & Karoum, 2022; Felahi & Saqri, 2022; Imouri & El Addouli, 2022; Zouiri & Kinani, 2022; Benzehaf et al., 2023; Dehbi et al., 2023; Laachir et al., 2023; Hamzaoui et al., 2024). However, they think they are overloaded with resources (Akhasbi et al., 2021). Added to this is that learning online requires autonomy as it is basically self-learning that demands digital literacy skills (Farih, 2023). Only one survey-based study doesn't back up hybrid learning: only 10% prefer it as opposed to 20% for online learning (Lakssoumi et al., 2022, p. 45).
High quality learning activities and content	Quality matters are not yet adopted. Rather, they remain implicit! No accreditation system for RL courses is put in place yet. During the pandemic, technology mainly served the purpose of connecting with the students. It was more used as a substitute for the face-to-face practices (Bouziane, 2022). Most of the input was one-way communication via videoconferencing and the content was static in the form of PDF or PPT or Word files (Benkaraache et al, 2020; Benjelloun et al., 2021; Felahi & Saqri, 2022; Ammor & Chafiq, 2024). Many students report their dissatisfaction with the contents and activities (Benkaraache et al, 2020; Benseddik, 2020; El Hammoumi & El Yousfi, 2020; HCP, 2020; Elmarhoum et al., 2020; Alaoui Mehrez, 2021; Asseraji, 2021; Elkhayma,

	2021; Jabari et al., 2021; Soufiani, 2021; El Malaki & Kroum, 2022; Hanni, 2022; Zouiri & Kinani, 2022;). Other studies report fair to high satisfaction (Bachiri & Sahli, 2020; Chemsi et al., 2020; Elfirdoussi et al., 2020; El Mousadik & Abentak, 2020; Hantem, 2020; Safsouf et al., 2020a; Benjelloun et al., 2021; Benmassoud & Bouchara, 2021; El Kharki et al., 2021; Ennam, 2021; Rahali et al., 2020; Hibbi et al., 2021; Sebbani et al., 2021; Naciri et al., 2022; Benzehaf et al., 2023; Bourray, 2023; Dehbi et al., 2023; Ksioura et al, 2023; Blilat et al., 2024). Fahmi (2023) reveals students' ambivalent attitudes towards online education and confirms that they believe in its potential effectiveness if internet access, appropriate devices, and adequate digital literacy are provided. Exceptionally, in some experimental studies, the satisfaction is reflected in the students' positive reactions or high performance (Lajane et al., 2020; Jaafari, 2021; Sabti, 2021; Safsouf et al., 2021; El Imadi et al., 2024). Ait Daoud et al. (2024) claim a significant correlation between students' learning styles and their performance. Even after resuming face-to-face teaching, students claim better quality contents (Kaouni et al., 2022; Alternatives to the existing contents, learning activities, and processes of teaching or assessing are put forward by many researchers (El Ouesdadi, 2020; Ennouamani et al., 2020; Idrissi Jouicha et al., 2020; El Aouifi et al., 2021; El Kharki et al., 2021; Hamdani, 2021b; Hamim et al., 2021; Iseksioui, 2021; Jaafari, 2021; Ouadoud et al., 2021; Sabti, 2021; Souabi et al, 2021; Brija & Marfouq, 2022; Daaqili & Bahite, 2022; Kaouni et al., 2021; Ouajdouni et al., 2022; Akhasbi et al., 2021; Mrisse et al., 2023; Ait Daoud et al., 2024). Such alternatives include the use of advanced data processing (Safsouf et al., 2021; Nanou et al., 2023), artificial intelligence (El Gourari et al., 2021; Kerrouch & Bouazizi, 2023), e-tutoring (Benaddi & Zegar, 2021); adaptive blended input (Ouariach et al., 2024). Many future jobs require knowledge of technologies and AI and thus Morocco should focus on them (Boulahoual & Rafik, 2024). The quality of the system is a predictor of student's success / satisfaction (Safsouf et al., 2020a). Nanou et al. (2023) suggest a five-layer model to analyze feedback provided by students, lecturers, and administrators in order to improve the adopted LMS or application. Safsouf et al. (2020a) show that the intention to continue using an LMS and self-regulation predict student success in RL system. The same authors (2020b) prove that the learner satisfaction depends on the quality of the system, course, and content. Ouajdouni et al. (2021) show that e-learner satisfaction contributes enormously to RL success.

Ongoing evaluation	The evaluation is far from being systematic. The available studies have reported case studies of implementing learning technologies by individuals or teams of researchers (Belhassan & Azegagh, 2021, see also *Shared Vision* above). Two reports have evaluated the experience of teaching during COVID in Morocco. One is done by the Higher Council of Education and Training and Scientific Research (Higher Council, 2021) but it focuses more on primary and secondary levels. However, some articles suggest areas of improvements (see the alternatives and shared practices suggested by researchers in this table above). The other one is by USAID and it focuses on an RL platform for teacher training and lifelong training (Porter et al., 2022).

Discussion

Like many countries, it should be admitted that Morocco was not ready for a shift to remote learning (remote learning) at the pandemic outbreak. Many initiatives, good or less good, were taken to overcome the disruptive classes. It should be raised that one of the virtues of the pandemic was that it brought the issues related to distance education to the surface. The number of publications on this area by the Moroccan researchers has increased substantially, though this number seems to decrease after resuming face-to-face teaching. Drawing on such publications, the subsequent part discusses the learned, or unlearned thereof, lessons to make effective decisions for a better integration of technologies in the Moroccan higher education system.

Lessons learned

Based on the data provided in the table above, both the students and lecturers showed a high degree of resilience and thought that the quarantine and closure of their institutions were appropriate measures to limit the effect of the pandemic. They then accepted remote learning (remote learning) as the only resort to make for disruptive classes. Many of them changed their attitudes towards remote learning (remote learning) and its benefits although both parties felt they were not ready to take this new mode of teaching and learning. They are more aware of its benefits than they used to be (Alami Neggady & Fahssis, 2019). Both faculty and students see online tasks as complementary to face-to-face rather than a new way of learning. Apart from one study (Lakssoumi et al., 2022), all the other studies show that

both Moroccan students and faculty prefer hybrid learning, though its type needs to be specified, while they massively reject purely online education. Both parties are aware of the benefits of remote learning (remote learning) and expect to benefit from it as supplementary to onsite provisions.

Many obstacles related to pedagogical, technical, financial, and organizational challenges have been identified. The shortage of adequate infrastructure, training in designing quality online courses, a clear policy of eLearning in Morocco hinder remote learning (remote learning) effectiveness. Such challenges have made Zine-Dine & Maliki (2023) claim that the misuse of terms referring to studying online mistakenly made Moroccans believe they shifted to another mode of delivery. Instead, they call for labeling what happened during the pandemic as Emergency Remote Learning / Teaching to avoid ambiguities inherent in other commonly used labels (p. 137). Actually, most of the practices reported in the literature above show that, following SAMR model (Puentedura, 2014), technologies were used as substitution and thus they had no functional change (Bouziane, 2022).

The students who showed fair to high degrees of satisfaction constitute a minority in higher education. They study in regulated-access public schools, in private schools, or in highly selective streams like masters or professional bachelors. They study in small size groups. They generally have a high degree of self-efficacy, as they mostly study technology or how to use it as part of their curricula, that facilitates their navigation of the platforms. Another factor is that they generally represent an elite belonging to reasonably high income and educated families. These students represent less than 20% of higher education students and study in schools with reasonable budgets (the cost per student in these schools is three to six times higher than the cost in open-access schools) and very high rates of graduation (90.6% without repeating and only 4.5% of dropouts in 2020) and high employment rate (79% of graduates are employed within a year) (Higher Council, 2020; MoHE, 2021). However, the students in open-access schools report their dissatisfaction as they belong to a less served type of higher education (Higher Council, 2018). This type is characterized by massification (87% of students), very high student/ lecturer and student/ administrator ratios and low budgets. These features result in lack of technical support, shortage of infrastructure, and lack of experience in distance learning by both lecturers and students. Generally, the students' degree of satisfaction about distance education depends on the quality of the system, content, and delivery.

Another lesson learned concerns the increasing number of research productions. A proliferation of research articles with varying degrees of rigor started just after the pandemic outbreak with the hosted journals by IMIST (Moroccan Institute of Scientific and Technical Information, https://revues.imist.ma/) playing an important role in publishing articles by Moroccan researchers. Actually, this proliferation has become an international phenomenon (e.g., Bilal et al., 2022; Aristovnik et al., 2023) as a bibliometric study on distance language learning over five years confirms the publications in 2020 nearly doubled those in 2019 (Ejjebli, 2021). Ironically, the publications in Morocco generally address subject areas related to sciences and technology, while Ejjebli (ibid.) reports that 77% of the publications on distance language teaching overseas deal with social sciences, arts, and humanities (ibid., p. 165). These unprecedented scientific productions have brought new ideas in understanding the students' and lecturers' preferences, practices, expectations and perspectives; improvements in the systems, design of online courses, and delivery; the barriers that hinder the implementation of online teaching such as connectivity, access, infrastructure, training, guidance and technical support; personal experiences, showcases, experiments; and especially the degree of stakeholders' satisfaction. These areas need further research; however, some overlooked areas are the learning loss, quality matters, the admin staff's perspectives and expectations, online assessment, and digital inclusion. Generally, the outcomes of some rigorous and well-designed studies are promising as they bring new ideas as alternatives like AI-based activities, learning analytics, adaptive learning, etc.

Lessons unlearned

For a long time, the Moroccan decision makers have been trying to integrate ICT in higher education to try to face the challenges the Moroccan universities encounter. Actually, this integration was motivated to accommodate the increasing numbers of students and to improve the quality of higher education. Actually, even before the pandemic, Moroccan universities attempted to integrate ICT through MOOCs and experiments in which hybrid learning was common. However, this integration suffered from three shortcomings. First, it remained as personal initiatives that served research purposes rather than a strategic and national approach to integrating ICT in Moroccan universities. Second, it was limited in some schools and universities, and even disciplines, as it was triggered by only innovators and a few early adopters. Third, it needed legal backup to be adopted as an option of teaching and learning as the law regulating distance teaching came out in 2021. Surprisingly, even after the pandemic, the recent laws limit the online teaching within 30% of a module.

Despite the substantial progress, the shared vision still needs more refinements to become a strategic adoption of ICT.

Another unlearned lesson is related to digital divide. This issue hardly occurred in research done before the pandemic because the experiments were done in regulated-access schools with adequate infrastructure and some well-off students who could afford device and connection expenses. The High Commissioner for Planning (HCP) report in a national survey that only 56% of higher education followed their studies during the confinement (HCP, 2020, p. 19). The survey-based studies during and after the pandemic have reported at least four types of digital divide. Sharp (2022) reviews the theories and empirical criteria of digital inclusion indices and calls for including the following components: "access/use; quality of access/use; affordability; and digital skills." (p. 30). As the table above shows, the Moroccan students find challenges in all the cited components. Providing the students with SIM cards to have free access solves only a small problem of digital inclusion. More research is needed to explain more this phenomenon following the methodology suggested by Sharp (ibid.).

In the same vein, the digital divide among schools may leave a big number of learners behind. Most of the researchers who have published success stories and good practices are from regulated-access institutions. Open-access institutions that accommodate 87% of the students are overlooked. An outstanding example is reported in Hayar et al. (2022). While the number of students in the regulated-access institutions in Hassan II University amounts to 30%, their connection rate to the platform reaches 44% of connections. The number of students in letters, humanities, and education represents 19% but their hits amount to 6% only (ibid.). Priority should go to open-access institutions to solve the massification issue and give more opportunities for the students to improve their rather poor performance. Worth mentioning is that the current Minister of Higher Education co-authored two articles in which the authors base their problematic on boosting remote learning (remote learning) to overcome the challenge of the increasing number of students as opposed to the slow increase of infrastructure (Idrissi Jouicha et al., 2020; Idrissi Jouicha et al., 2021).

Quality of online courses has been overlooked in the reported research. Actually, the quality in this article is only inferred from the students' reactions towards content. Most of the practices and showcases shared by lecturers do not highlight the quality system they followed. There hasn't been a systematic study of content analysis from quality perspective. Also, universities have not issued checklists or mechanisms of monitoring quality before

implementing the course at hand. Similarly, apart from the length of the videos to produce and broadcast on TV, the quality and layout of videos are not specified.

In the reviewed research studies, the different stages of teaching and learning process did not receive equal attention. The delivery and the monitoring of distance education took a big share of the scientific productions. However, two essential components have been overlooked: designing courses and assessment. These two components should be aligned as suggested by Quality Matters organization (https://www.qualitymatters.org/). More research, and expertise, will help to produce customized guides to enable the faculty to produce better online courses.

The alternatives provided by the researchers touch a transformation of learning and teaching as related to systems, platforms, delivery, assessment, interactivity between the students and lecturers. Added to these, there are suggestions related to AI, development of algorithms to improve learning processes, learning analytics, and adaptive learning plugins to monitor the learners' progress. Apparently, most of these suggestions emanate from experiments or applications that have been done for publication purposes only. Their implications need to be mutualized and implemented in the existing platforms.

The efforts made by institutions or individuals are neither mutualized nor capitalized. The wonderful experiments, simulations, and innovative showcases reported in the table above indicate that the Moroccan researchers have the possibility to improve the technical systems, the delivery methods, the coaching system etc. to better serve the learners. However, these initiatives are merely published as articles to be consumed in academia. Rather, they should be adopted by universities and promoted by the Ministry to be implemented properly to improve higher education provisions. This is possible through state-owned consultancy institutions and directorates.

Implementing much of the above-mentioned expertise needs more structured teacher training programs. The trainings should address areas related to both technical and techno-pedagogical issues. Most of the trainings delivered during the pandemic were about how to run the platforms or to use applications to produce digital contents and design tasks. However, shifting to distance education is far beyond putting old wine in new bottles! Digital transformation "… is not just about digitizing lectures or using software to prepare lessons but also about the transformation of all teaching methods and techniques, classroom management techniques, and interaction with learners into the digital space, harnessing information technology to organize successful teaching." (Phuong et al., 2023, p. 12).

A further unlearned lesson is related to the diversity of technologies used. Lecturers use different software and hardware programs. It is not surprising to find faculty members using different technologies within the same departments. In addition to complexities of remote learning (remote learning), these disparities may create usability issues and thus slow down learning online. Instead, universities should opt for frugality in the choice of applications and better add these applications as plugins in their respective platforms.
Based on the unlearned lessons above, the journey to digital transformation in higher education in Morocco seems too far and the steps taken for it seem too slow. The number of hindering issues remain unsolved, though many of them were identified prior to the pandemic, and the continuity of the wonderful works done during the pandemic seems unsustainable. The outcomes of the publications in the ISTE Essential Conditions as reported in the table above show that there is already a great potential to make this transformation successful but leadership at all levels should get more involved to contribute to it.

Conclusion

Despite the progress that Morocco has made in remote learning (remote learning) during the pandemic and the proliferation of research studies, the future of remote learning (remote learning) in Morocco still needs further scrutinizing. Morocco, like other countries, did not start its online education adventure from a scratch but it was not ready for the challenges of the abrupt shift to online education. Even after some time, it seems that it is not ready yet to adopt this new normal. The situation is too complex because the Moroccan system of higher education has accumulated many deficiencies in its face-to-face practices and the online education has added more challenges that are beyond the system itself such the digital divide. Another facet of complexity is that higher education cannot remedy its own deficiencies and those inherited from the primary and secondary levels. Thus, a new agenda of research should start to evaluate all the stakeholders' readiness to take online education. As suggested in the unlearned lessons above, there are still many pending areas that are worth investigating. In the meantime, research should focus on evaluating the experience of online education during and post-COVID-19 to draw more lessons that will serve as basses for better implementation of this rapidly evolving area. This new path of research should capitalize the great achievements in the literature reviewed in this article to turn failures into lessons, inspire form success stories, implement successful achievements, and mainly sustain the good practices put in place during the pandemic and improve the contents and courses that were produced hastily.

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