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ASSESSMENT PRACTICES OF LEARNING OUTCOMES IN DIGITAL LEARNING ENVIRONMENTS

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Abstract- With the COVID-19 pandemic taking over the world, teachers in Morocco and across the globe have been tasked with the responsibility of ensuring that distance learning continues smoothly in appropriate digital learning environments. This has led to a significant shift in teaching and learning practices, including the adoption of new methods of evaluating acquired knowledge and skills for both training and certification purposes. The pandemic has made it even more challenging to assess achievements in digital learning environments, further complicating the already complex issue of evaluating student progress. This unusual situation has led to the emergence of new educational phenomena, in particular the assessment of distance learning. The intention of this study is focused on distance education in Morocco during the COVID-19 period, and on the different methods of evaluating achievements in digital learning environments as well as the evaluation practices of Moroccan teachers, and this in order to contribute to the reflection on this subject, with the objective of developing its practices to be more constructive in similar crisis situations.

Keywords: Prior Learning Assessment, Digital Learning Environment, Distance Education, COVID-19.

1. INTRODUCTION

Evaluation and digital is not a novelty. For several years, various devices such as media and software have been developed for computerized evaluation, and a considerable amount of literature has been produced on this subject. The Evaluation of Learning and Information and Communication technologies by Jean-Guy Blais [1] is a notable example, offering a comprehensive view of the different components specific to the use of information and communication technology (ICT) to mediate the operations of task presentation, data collection, storage, correction and grading in the context of learning evaluation. Dozens of other works have addressed this topic and especially during and after the outbreak of COVID19. The observation drawn from our research shows that this work is carried out by a minority of researchers, who often meeting skepticism from other practitioners.

Another paradoxical observation that stands out and must be highlighted: the pedagogical practices of teachers have not kept pace with the significant and rapid technological advancements of recent decades. A study by Detroz [2]. On the assessment practices of higher education teachers confirms this observation: only a few have integrated information and communication technologies into the assessment of their learners. Koehler and Mishra [3] explain by saying: effective digital teaching necessitates not only pedagogical and didactic skills but also a degree of digital literacy. This plurality of skills in the use of digital technology in evaluation and the fact that training in evaluation is almost absent in the teacher training course explains the complexity of the issue. The advent of COVID-19 imposed the digital reality on this experience of distance education; the teaching community was absolutely not ready to explore the potential of distance assessment, thus causing a great lack of understanding of the various issues of this practice. After this crisis, today many teachers still consider digital as antagonistic to educational values but several others see it as a potential that had previously eluded them.

2. THEORETICAL FRAMEWORK

Assessment is an essential step in the learning process and constitutes a significant part in the workload of teachers. The evaluation of learning (partially or totally) can be facilitated by the digital tool. Evaluating digitally involves carrying out the activity of evaluating learning, in whole or in part, through digital means. This approach relies on electronic, computer and digital instruments (machines, computers, software, applications, computing environments, etc.). This assessment can take various forms such as sound recording, multiple-choice questionnaire, text composition, film production, forum participation, concept map creation or a portfolio, and many other forms.

Today, digital tools for evaluation are becoming increasingly easy to use and are widely accessible. In this case, the evolution of technologies leads to the evolution of pedagogical approaches and educational activities. With them, evaluation practices are also evolving. Today, we are witnessing a proliferation of forms and evaluation practices, from the simplest to the most complex.

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Indeed, with the digitization of teaching tools and the rise of distance learning, blended learning or other flipped classroom models, with the proliferation of synchronous and a synchronous communication tools, space and time are no longer conceived in the same way. Are such shifts in design also evident at the level of evaluation? Is the distance (spatial and/or temporal) between evaluators and learners compatible with the dimension of regulation of learning, or of its control, inherent in the different evaluation models [4]? And what roles do new digital tools play in these systems?

First, we question the evaluative act, between support for prediction, learning, the organization of teaching or the formalization and recognition of acquisition. The assessment will be qualified as:

- Certification when it serves to report, to officially recognize [4, 5, 6];
- Formative when it aims to organize teaching according to acquired knowledge or needs [7, 8];
- Diagnose in order to know each person's prior knowledge and judge the relevance of offering such learning at such time [6, 8];
- Trainer to enable learning by linking referentialization [9], self-assessment, diagnostic, formative and certification assessments [4, 10].

Second, the focus of the evaluation which can be pure knowledge such as a skill mobilized in an unknown situation, a skill or even an attitude. Still for the sake of simplicity, four evaluation objects have been retained:

- Knowledge, which refers to levels one and two of Bloom's taxonomy;
- Know-how that concerns both professional gestures and the application of a theoretical notion in a classroom context;
- Soft skills or attitudes [11];
- Skills [6, 12].

Third, the four levels of the mode of evaluation, which answers the question evaluate from where? at all in presence at all at a distance are used according to school circumstances. And the object and the intention of evaluation can be called upon to be modified by the digital tools available:

- Face-to-face: traditional work in a classroom, possibly using digital tools;
- Enriched face-to-face: mainly work in the classroom with certain activities offered online (during class time and/or outside class time);
- Hybrid (blended learning): articulation between face-to-face courses and online training;
- Online (online): All activities are done remotely, whether synchronously or asynchronously.

In Morocco, the Ministry of National Education has, for over a decade, been introducing the teaching of information and communication technologies (ICT) to benefit university students and trainee teachers in Regional Centers for Education and Training (CRMEF). A significant number of school teachers have benefited from continuous training provided under the GENIE program strategy (Generalization of Information and Communication Technologies in Education in Morocco and the Moroccan-Korean Training Center (CMCF). In reality, these trainings did not reach all teachers as they were not compulsory. However, a good number of these educators, eager to innovate, have shown interest in participating in this type of training.

In this context, we quote Thierry Karsenti, an expert in educational technologies, who asserts that "technologies have a real impact on learning, motivation..., it is still necessary to develop the art of teaching with technologies". Similarly, as Lameul stated, "there are no good or bad technologies but more or less good pedagogies using technologies" [13]. In short, the primary role of the school or university is to show learners how to effectively utilize information and communication technologies and, to provide a favorable context for their exploitation.

3. MATERIALS AND METHODS

This study was carried out at the national level, encompassing public school teachers as well as private sector schools, located in the various regional Moroccan education and training academies, during the 2019/2020 and the 2020/2021 school years. The target population of our study consists of 120 primary, middle school and secondary school teachers. To collect information related to the issue under study, we utilized questionnaires as a research tool. Teachers were subjected to a questionnaire and individual interviews in order to better understand their perspectives and needs. The questionnaire developed for this study comprises a total of thirty questions; however, for our research, we selected the ten most relevant ones.

The questions formulated pertain to each aspect related to this subject and are designed around the following themes:

1. General information: this section aims to identify the characteristics of the respondents;
2. Information and Communication Technologies for Education: the goal here is to gain an overview of the technical skills related to various manipulations and the use of technological tools;
3. Distance Education in the Period of COVID-19: this part aims to assess the teachers' commitment to distance education, as well as the most commonly used methods for teaching distantly;
4. Evaluative Practices on Digital Learning Environments: the objective is to determine if evaluation has been a potential constraint in distance education during the COVID-19 period in Morocco.

Regarding the individual interviews, these were carried out with a group of 40 teachers from different regions of the country, representing different educational levels (Primary, Middle School and High School). These teachers have effectively engaged in distance learning during the COVID-19 period and reported that they had tried to assess their students' learning. These interviews were of semi-directive types around five main questions. The objective was to determine the evaluation methods that these teachers had adopted to assess their students' learning outcomes after completing distance learning courses during COVID-19 period.

4. RESULTS AND DISCUSSION

General overview of the study: The population targeted by our study consists of 120 teachers from various educational levels (Primary, Middle School, and High School). The gender distribution includes 44.2% women and 55.8% men as depicted in Figure 1. On the other hand, the study encompassed teachers from rural, urban and semi-urban areas. The majority of the participants were from urban areas, accounting for 62.5% of the total, followed by 18.3% from rural areas, and 19.2% from semi-urban areas.

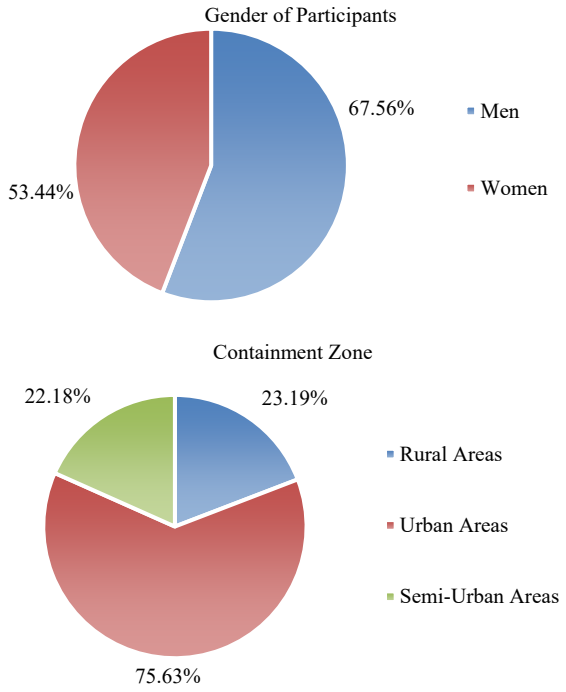

Figure 1. Gender of Participants and Containment Zone

The study also targeted teachers in the public sector as well as those working in private schools. Participation comprised 80.8% of teachers from the public sector and 19.2% from the private sector, spread across 12 regional academies, as depicted in Figure 2.

Information and Communication Technologies for Education: From a technological point of view, the study showed that there is a great lack of training among teachers in Information and Communication Technologies for Education (ICTE). 47.5% have not taken any training in ICTE (Creation of educational content, Communication platform, e-Learning platform) as part of the continuing education programs organized by their provincial directorates or their schools. This lack of training clearly contributed to the difficulties they encountered in operating various tools that were implemented to ensure educational continuity during the COVID-19 period. In the light of these observations, the covid a period is an emerging context for new innovative ideas.

At national level, the Ministry of Education, in collaboration with its various partners, is inviting teachers to showcase their potential in terms of digital pedagogy and to make technology an essential support for teaching and learning. In concrete terms, the commitment to encouraging innovative projects has been demonstrated through the national competition, crowned by the Innovative Education Forum. It should be noted that these competitions constitute a material and human envelope, making it possible, on the one hand, to optimize the use of technologies in order to improve the quality of teaching and encourage the commitment of learners. On the other hand, to design projects that can be exploited like a database thanks to digital technology [14].

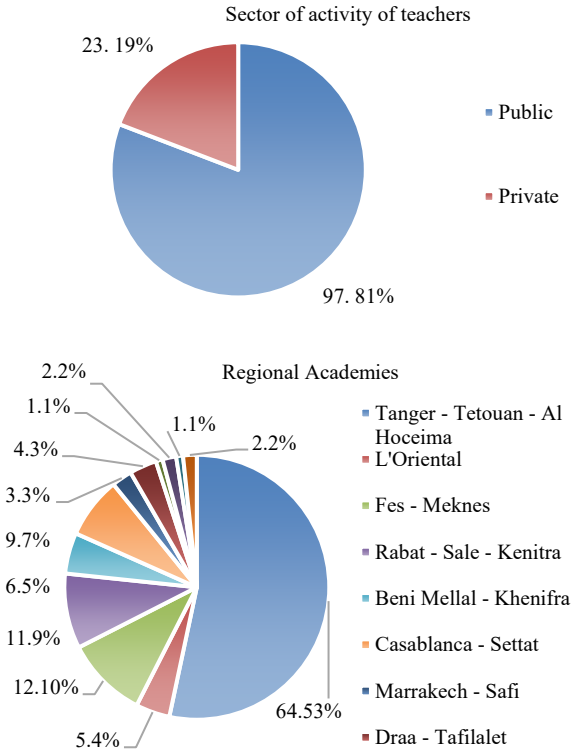

Figure 2. Sector of activity of teachers and their regional academies

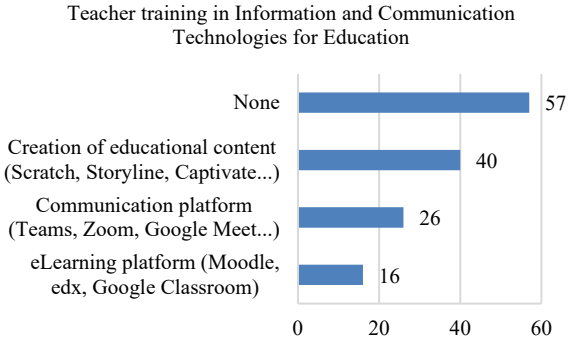

Figure 3. Teacher training in Information and Communication Technologies for Education (ICTE)

During the COVID-19 period, another paradoxical observation that we made in this study explains the failure of the Moroccan education system's experience with distance education. It was found that a significant number of teachers, 82.5% in our sample, were committed to delivering the remainder of the school program remotely during the 2019/2020 and 2020/2021 school years.

However, there was a significant deficit in their training and practical experience in distance education. Experience has shown that the identity dynamics of teachers who volunteer for distance converge with institutional dynamics in this case for three main reasons: (1) the desire to adapt to institutional and societal changes; (2) the desire to regain a space of freedom; (3) the fact of taking up a personal challenge [15]. The reflexive dimension is mentioned in a two-and-a-half-line paragraph where it is stated that this dimension is taken into account in the professional development of future teachers thus ensuring the link between the CRMEF and the socio-professional environment (Guide to procedures for managing initial teacher education for the year 2020-2021) [16].

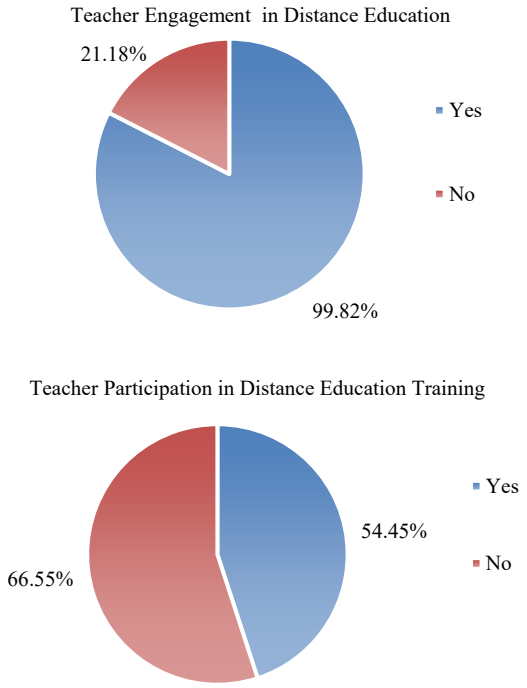

Figure 4. Teacher engagement in distance education, and teacher participation in distance education training

The tools that teachers found effective for teaching distantly primarily included communication tools (62.3% favored WhatsApp and 24.5% Facebook) and video sharing platforms (58.5% for Youtube and 18.9% for TelmidTice platform). These were preferred over dedicated distance education tools such as digital learning environments (35.8% for Microsoft Teams and only 1.9% for the Moodle Platform and others). These results can be attributed to a significant lack of training and practical experience in the use of digital learning environments.

Morocco has invested many resources so as to integrate Information Communication and Technology (ICT) in teaching. However, this integration tackled mostly the material aspect like data shows, computers, tablets [17]. and with the health crisis the Ministry of Education has invested more in software, in particular the setting up of a new learning environment, TelmidTice, which has recorded unsatisfactory attendance for a number of reasons, which can be summed up as a lack of preparation on the part of the two main stakeholders in this process, teachers and learners.

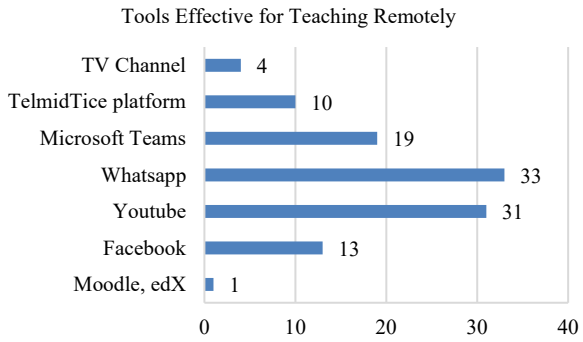

Figure 5. Tools that teachers find effective for teaching remotely

The most commonly used methods by teachers for distance teaching during the COVID-19 period were primarily PDFs, PPTs, and DOCs, followed by videos, then emails, and direct phone calls. These results indicate that range of resources and educational activities provided by digital learning environments are not being fully utilized by the teachers, and there is a particular attraction to social networks and visual content, especially video.

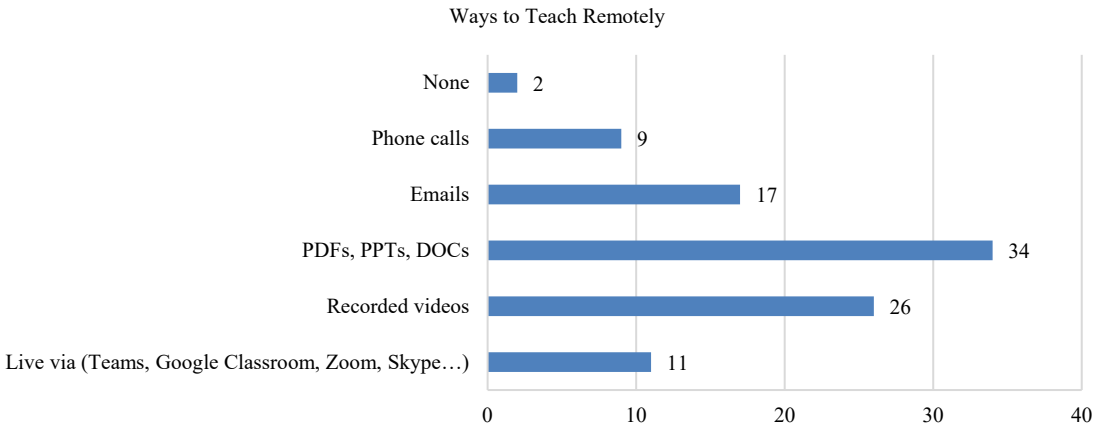

Figure 6. The most popular ways to teach remotely

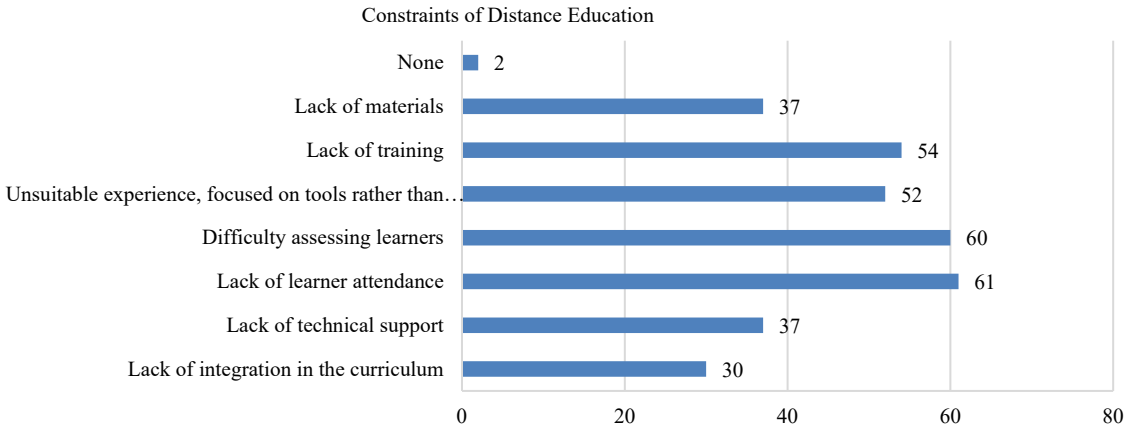

Figure 7. The constraints of distance education in times of COVID-19

Table 1. Quality criteria for evaluation devices

Criteria	Explanations
Validity	The information resulting from the evaluations must represent what the teacher wants to measure, allow solid inferences, cover the important aspects that were to be evaluated, and this, in relation to the objectives and content taught. p. ex. (Cronbach and Meehl, 1955); (Linn, Baker and Dunbar, 1991); (Anderson, 2002)
Loyalty	The processing of the results must provide guarantees of objectivity. The subjectivity of the teacher must be controlled during the corrections of the evaluations (intra-evaluator concordance, but also inter-evaluator if several teachers intervene). This can be done using criterion-referenced evaluation grids. p. ex. (Cronbach, 1951); (Pieron, 1963); (Ebel, 1969); (Brown, 2019)
Sensitivity	Measurements of learning achieved must be precise and reflect subtle phenomena. p. ex. (Abernot, 1996); (Leclercq, 2003)
Diagnosis	Feedback sent back to learners after correction mustallow the precise diagnosis of strengths and points to be improved and facilitate the regulation of learning and teaching. Feedback is all the more beneficial as it helps learners to correct their mistakes and provides indications on the way forward to improve learning. p. ex. (Alderson, 2005); (Hattie and Timperley, 2007); (Jang, 2008); (Jang and Wagner, 2013)
Equity	Learners must be treated fairly, without discrimination, in principle in the same way. p. ex. (Messick, 1981)
Practicability	Carrying out the assessments must be feasible within a reasonable timeframe and with the help of available human and material resources. p. ex. (Gilles and Leclercq, 1995)
Transparency	Non-confidential information relating to the processes and issues of the evaluation must be communicated and understood by all those involved in the evaluation. Awareness of the objectives targeted by the evaluation must allow those evaluated to understand what is expected, in a learning support process. p. ex. (Birenbaum, 2007); (Reinholz, 2016)
Authenticity	The questions and tasks proposed during assessments must make sense for the learners questioned, be relevant to their context. p. ex. (Kerka, 1995)
Self-evaluation	Promoting self-assessment and explanation among the assessed learners allows them to become aware of the points to be improved, which can contribute to supporting their learning. p. ex. (Leclercq, 1982); (Chi, from Leeuw, Chiu and Lavancher, 1994); (Reinholz, 2016)

Assessment Practices in Digital Learning Environments: Among the significant challenges faced in distance education during the COVID-19 period, as expressed by teachers, were the lack of student attendance and the difficulty in evaluating them. This was particularly notable, as depicted in Figure 7. The COVID-19 crisis experience is presenting different challenges that should be addressed to develop new methodologies and pedagogical approaches, infrastructure and platforms specifically designed for online teaching [18]. These new methodologies need to be developed in an interdisciplinary and holistic perspective that (following the responsible research and innovation approach) will anticipate and assess potential implications and social expectations [19]. Another question raised concerns teacher-learner relationships in distance learning and whether teachers should in fact determine and control the content, pace, rhythm and success levels of learning activities in this context [20].

According to the individual interviews that we carried out with a group of 40 teachers on the methods of evaluating learning during the COVID-19 period, the latter expressed that these methods were articulated around sending via WhatsApp or email evaluation copies (Questions, Closed or Open Questions) containing exercises that learners had to do at home and send them back later via WhatsApp or email. These assessment practices have not met many of the quality criteria for assessment devices. Indeed, in reference to the context of the work outlined above, we will direct the remainder of our discussion towards a series of quality criteria in evaluation that we deem important to present to teachers. We anticipate that these criteria will be readily understood and applied by them. These criteria are relevant to any type of evaluation, whether conducted online or otherwise. Our aim is pragmatic: to provide practitioners with criteria they can utilize to design their remote assessments. Another aspect that we want to show through this study and that we consider very beneficial to teachers, concerns in particular the forms of digital assessment, [21] distinguishes three types of remote assessments.

The first concerns "fully online assessments", most frequently in the form of formative and summative questionnaires (often MCQs) with automatic correction

and personalized feedback. The second type of remote assessment is related to "online assessment activities" "whose correction (...) is however not automated" [21]. These activities include, for example, forums, e-portfolios, work repository features in digital learning environments, blogs, wikis, audio and videoconferencing, mind maps. The third type of remote assessments is forms of "assessment support" where the assessment does not take place on the web, but is facilitated by online tools.

These include, for instance, tools for filing and transmitting information related to evaluations. One example is the use of email to send learners visual or multimedia feedback. Additionally, evaluators may use software to assist in correction processes. Remote assessment thus encompasses a broad spectrum of possibilities. These range from the use of email for simple communications to automated questionnaires (often multiple-choice questions), and extend to more sophisticated instruments like adaptive tests. Adaptive tests adjust to learners' performance, similar to certain language tests or online simulations.

5. CONCLUSION

The experience of distance education, whatever the degree of its success, was surely a triggering event that undoubtedly made it possible to emphasize teaching practices in Morocco by exploring new possibilities in terms of teaching and learning in the digital age. Already, in FAD, evaluation is often considered the main "moment of meeting", as described by Renucci and Bertacchini. Increasingly, it becomes "the center piece of any device". Rather than designing training from theory, we must "reverse the tide and instead adopt an engineering method that prioritizes the strategic planning of evaluation" and that bases this evaluation engineering on a new approach and new skills adapted to the pedagogy of network training [22]. If online assessment is indeed an opportunity to rethink assessment and learning, is its widespread adoption inevitable, as Ridgway and McCusker suggest? And what are the specifics of the 'what, when, and how' they refer to?

Presumably, the responses to these questions will be as varied as the forms of internet assessment itself. As for summative online activities assessed in the traditional way, such as those based on cyber portfolios or blogs, there are relatively few obstacles to their implementation. On the contrary, they are attracting a lot of interest as a means of creating interest in learning and diversifying the skills to be assessed. In these cases, it will, above all, be a question of encouraging innovation, sharing practices and evaluating pilot projects. With regard to the diagnostic, formative and adaptive uses of automated assessments, the apprehensions expressed are limited.

However, they require in-depth knowledge of the cognitive processes involved and require significant design efforts. Are the national Ministry of Education and schools in Morocco ready to support this development, which is more useful for improving learning than for productivity gains? In their case, as with previous evaluations, will the initiatives remain ad hoc, linked to a few precursors, or will we see real strategies leading to large-scale systematic use?

Indeed, this study aims to highlight the contributions, advantages and disadvantages of the mode of distance education and to provide an analysis of evaluative practices in the Moroccan context, especially during the period marked by the crisis caused by the Covid-19 pandemic. It is evident that this mode of teaching offers several advantages for improving the level of learning of Moroccan students but also presents significant shortcomings that need be addressed, particularly in terms of evaluation practices adopted. In this regard, Moroccan educational institutions should introduce Moroccan students to the correct use of New Information and Communication Technologies (NICTs) in the field of education and to provide a favorable context for its exploitation. Teachers, for their part, must meet the expectations and standards of the digital natives that are today's learners [23].

The digitization of education in Morocco will clearly have advantages when we manage to adopt the two modes of education in a complementary way while taking into account the particularities of the Moroccan context through:

1. The guarantee of equity in terms of access to the means of technology;
2. The integration of all partners to generalize the dissemination of the connectivity of learning resources within the framework of logic of citizenship;
3. A radical change in the culture of use of NICTs by establishing learning autonomy among Moroccan students while moving from logic of entertainment to logic of E-learning.

Finally, the period we are living in requires a lot of creativity and adaptation, which leads us to return to basics. The quality criteria set out are part of this effort to generally improve the quality of the evaluation.

NOMENCLATURES

Acronyms

ICT	Information and Communication Technology
CRMEF	Regional Training Centers and Education
CMCF	Moroccan-Korean Training Center
ICTE	Information and Communication Technologies for Education

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