Distance Teacher Training and Assessment in the Era of Covid 19 Pandemic

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***Abstract*—The situation induced by the Covid-19 health crisis has urged the pedagogical actors in education and training into an emergency mode of distance education. Previous research conducted during this period of health crisis, showed a major focus on the experience of distance teaching and assessment in both school and university contexts. Nevertheless, research in the context of pre-service as well as in-service teacher training is very scarce. In this regard, it seems appropriate to focus more on distance teacher training and distance assessment within the Regional Centers for Education and Training Professions, in French "Centres Régionaux des Métiers de l'Education et de la Formation (CRMEF)". To achieve this purpose, a survey was conducted at the end of the pandemic containment period. The survey consisted of two questionnaires. The first one was administered to 20 teacher trainers of different specialties. The second one was addressed to 46 teacher trainees of the 2020 cohort. Analysis of results revealed that all the participant teacher trainers interviewed offered teacher training and conducted assessment from distance, using different instruments and modalities. However, the evaluations carried out at a distance were, in the majority of cases, formative evaluations with a rate of 93%. The respondents also reported that the main objective of these evaluations was to support and regulate the learning of future teachers. The study also recommends the promotion of distance teacher training and distance assessment procedures, as well as, the construction of valid and reliable digital equipments and adaptive e-learning platforms.**

***Index Terms*—Distance teacher training, distance assessment, Covid 19 pandemic, CRMEF, Morocco.**

I. Introduction

The Covid-19 pandemic was not just a health crisis but also a planetary crisis in education and training. In all countries, the functioning of educational institutions has been disrupted, teaching methods and teaching practices destabilized (Thematic report, November 2021)[1].

The pandemic has indeed caused the closure of schools for "more than 90% of pupils in the world, or 1.5 billion children and young people" (Report of the Secretary General, 2020)[2].

The situation induced by the Covid-19 crisis has precipitated the pedagogical actors of education, teachers and students, into an emergency distance education mode.

Preliminary national and international research has shown that the experience of distance teacher training and distance assessment during the Covid 19 pandemic has contributed in promoting professional development of teachers. Nevertheless, several obstacles and challenges have been reported on the technological, pedagogical, professional, emotional and on the social levels. The promotion of teachers' digital skills during pre-service and in-service training, with a regular follow-up of the actions implemented, are a necessity.

Analysis of previous research, cited primarily in the theoretical framework of this article, has shown a major focus on the experience of distance teaching and assessment in the era of the Covid 19 pandemic, in a school context (primary and secondary education) and in a university context (higher education). While research in the areas of distance teaching and assessment in the context of pre-service and continuing training is very limited.

In Morocco, the Regional Centers for Education and Training Professions, in French: "Centres Régionaux des Métiers de l'Education et de la Formation (CRMEF)" are Moroccan educational institutions that offer pre-service teaching training for prospective teachers. Their mission, according to the Ministerial Decree creating the CRMEF[3], is the pre-service teacher training for teachers, training for the preparation for the aggregation competition, the training of other practitioners specialized in administrative, pedagogical and social support. Moreover, these institutions offer some continuing professional sessions for teachers at the regional level. Conducting research projects for reform and innovation are also some missions of the CRMEFs. All these different forms of training essentially aim to meet the increased need for qualified teaching staff, to update educational practices and to adapt to the new demands and expectations of the Moroccan society.

During the second half of the training year 2019-2020, the Covid-19 pandemic forced practitioners to switch from face-to-face training to distance training. Trainers from different disciplines found themselves obliged to provide

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[1]National evaluation body of the Higher Council for Education, Training and Scientific Research. "Teaching at the time of Covid in Morocco", Thematic Report, November 2021. https://www.unicef.org/morocco/rapports/enseignement-au-temps-de-covid-au-maroc

[2]United Nations, Economic and Social Council "Annual Update on the Sustainable Development Goals. Report of the Secretary General, June 28, 2020. p. 8. https://unstats.un.org/sdgs/files/report/2020/secretary-general-sdg-report-2020--FR.pdf

[3]Ministerial Decree creating the CRMEF, n 2.11.672, 23 December 2011, Rabat. Available on: https://www.men.gov.ma/Ar/Documents/D_2.11.672CRMEF.pdf

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distance training with the on-board means and with the technological skills at their disposal. Moreover, these trainers had to produce and share digital courses and evaluate training of future teachers from a distance.

To ensure the continuity of learning within the CRMEFs, several solutions have been implemented, video-conference meetings, offline interactions through forums and by sharing text, audio, video teaching resources, etc… and through distance learning platforms (e-Takwine, Teams, etc…). All these solutions have influenced, to a large event, the promotion of distance teacher training.

In addition to this, the online assessments that were conducted during the period of the Covid-19 confinement were primarily intended to support and regulate the learning of prospective teachers. These online assessments were not final or end-of-semester exams. The teacher trainees took the face to face validation exams for the second semester modules late in January 2021. These exams constituted 75% of the trainees' passing grade. Nevertheless, in normal situations, the end of training exams are carried out at the latest during the month of July (2020).

It is certain that this shift of teacher trainers to distance education has triggered their reflection on 'traditional' practices and offered them opportunities to experiment new teacher training practices. This experience of using Information and Communication Technologies (ICT) during the pandemic has enhanced quality teaching and contributed to professional development of future teachers. In addition to this, successful distance training and evaluation require effective planning and management based on decision-making and the commitment of the two pedagogical actors (trainers and trainee teachers) with regular monitoring of the effectiveness of the actions. However, in the situation of this crisis, the trainers did not have the possibility and the time to plan and think about all these aspects.

Through this reflection, we wish to focus more specifically on the field of training and evaluation of distance learning. In this article, we address the practices, the tools, the challenges and the constraints of online training and assessment within the Regional Centers for Education and Training Professions (CRMEF) during the period of Covid-19 confinement.

The objective of this study is to assess the attitudes of teacher trainers and teacher trainees, the benefits advantages as well as the barriers to challengers related to distance training and assessment inside the CRMEFs. It also aims at shedding light on the expectations and needs of the two pedagogical actors (trainers and trainee teachers). Bearing in mind that reflection and experimentation of new technologies in training can promote distance training and distance assessment practices, and can also ensure a complete pre-service teaching training and evaluate the achievements of future teachers with much more confidence and conviction even in difficult and unpredictable situations such as those imposed by the Covid-19 health crisis.

To that end, this paper is organized as follows. The first section introduces key terms and reviews previous works on distance teaching training and assessment in the era of the Covid 19 pandemic. We formulated the problematic of our research, taking into account the limitations of some previous studies. The second section of this paper describes the research methodology adopted. Section three is about analysis and discussion of results. This section is divided into two sub-sections, the first one is concerned with distance training during Covid 19 and the second focuses on distance assessment. Finally, in the last section, section four, we present the conclusions and perspectives of our research.

II. Theoretical and Problematic Framework

Internationally, researchers in docimology have been trying to clarify the processes of evaluation development for decades [1]-[3].

Criteria for assessing the quality of evaluation devices are among the concerns of many researchers around the world. Furthermore, the Assessment for Learning approach, Black & Wiliam [4] brings a new dynamic to the field of formative assessment. The focus is on active learner engagement and devices that support learning and provide informative feedback to foster self-regulation and lifelong learning [3], [5].

It is certain that distance learning assessment can support, support and self-regulate learning. On the other hand, the majority of pedagogical interventions that rely on the use of digital technology for distance assessment have been found to have no clear effect. Research by Hettiarachchi & Huertas [6], Blais, Gilles & Tristan-Lopez [7], Detroz & al. [8], Charroud Christophe & al. [9], Noureddine Samlak [10] have shown that there are several challenges, hindrances and barriers to using digital for distance assessment. The docimological problems related to the validity, fidelity and reliability of remote assessment devices still remain.

With the Covid-19 pandemic and the support of digital technologies, a transition to distance learning was imposed, teachers switched to e-learning in a health anxiety situation. Teaching and therefore evaluation was transformed into remote interactions. Teachers had to demonstrate extraordinary pedagogical flexibility in a very limited amount of time and in a time of uncertainty and stress [11].

The most recent research, at national and international level, has focused on educational and evaluative pedagogical practices during this period of urgent and forced MOOCification.

Detroz *et al.* [8] studied the impact of the situation of pedagogical rupture caused by the confinement on the teaching-learning process in universities in France. These researchers estimated that the pedagogical emergency can nevertheless be a vector of innovation, by using information and communication technologies to reinforce student's activities and accentuate their feeling of control and competence.

These researchers have stated that the outright transposition of examination modalities to distance is far from being resolved. Adaptations in each online course have most often involved replacing written tests with distance orals or online assignments, or replacing terminal assessment with continuous assessment.

Alonso Vilches *et al.* [12] evaluated the reception of the "switch to e-Learning" prescription on teachers' professional identity in order to understand the effect of the change in practice on professional development. The results of their

study showed that the questioning that the digital conversion provoked had a significant impact on the way teachers conceived their professions, and this very early in the period of confinement. These researchers concluded that it makes sense to encourage development networks in a sustainable path of reflection from each of the interactions of the constituent areas of professional development.

Lollia and Issaieva [13] studied the impact of the unprecedented health crisis caused by the Covid 19 pandemic on teachers' management of educational continuity. To measure this impact, these researchers conducted a questionnaire (with 198 teachers) and interview (with 7 teachers) survey. The results of their study revealed that the teachers interviewed attempted to adapt, develop and/or vary evaluative approaches and tools, but felt trapped by the reality of the field. The teachers interviewed were not able to establish real interactions using all of the tools deployed, so regulation and remediation were not feasible at a distance.

Barras and Dayer [14] measured the impact of Covid-19 pandemic-related containment on teaching learning in online courses. To measure this impact, these researchers used two courses as examples, the first example is a first-year bachelor's course in elementary education with 61 students and the second is a first-year master's course in health sciences with 29 students. These researchers noted that the teachers' intention during this period of crisis was to ensure pedagogical continuity by guiding the students. The teachers encouraged their students' engagement through a formative evaluation device. The analysis of the first feedbacks of this experience showed the relevance of the actions chosen during the reflections carried out during the changeover in the emergency and thus the pedagogical continuity. The quality of the students' productions matched well to the teachers' expectations. These researchers concluded that the formative evaluation put in place was an effective response to support the students in this complicated period.

Hodges *et al.* [15] studied the difference between emergency distance education and online learning, they showed that well-planned online learning experiences are significantly different from online courses offered in response to a crisis or disaster. They stated that effective online learning results from careful instructional design and planning, using a systematic design and developmental model. In the same vein, Atmani [16] added that distance learning appears to be conducive to exchange and collaboration, but at the same time places the student in a more empowering pedagogical relationship that may disrupt their learning habits and therefore be a source of difficulties related to managing units space and time.

Villessèche *et al.* [17] developed an adaptive online learning platform that enhances learners' skills from elementary school to university. These researchers stated that the development of this platform has offered new possibilities, especially in terms of pedagogical and research scenarios that target the development of individualized cross-curricular skills.

Gilles and Charlier [18] conducted a comparative analysis of two automated and non-automated remote assessment devices. They compared two forms of assessment that could be used in the context of the Covid-19 health crisis: fully automated online multiple-choice questions (MCQs) and remotely managed long open-ended questions (LOMQs) that require the intervention of a human scorer. These researchers stated that in such an approach, it should be emphasized that the time savings provided by the automated scoring offered by online MCQs could be advantageously used by teachers to improve the reliability of scoring QROLs and to refine feedback combining information from both forms from a learning support perspective.

Gilles and Charlier [18] concluded that the various digital means make it possible to capture data on a broad spectrum and in a sometimes automatic way. They make it possible to observe the course of learners in a longitudinal manner. Also, computerized means can save time by automating certain procedures, for example, the correction of tests intended for large groups of students.

To provide an update on the benefits of remote automated assessment, Ryan *et al.* [19] conducted an online survey of 4514 Australian university students. The results of their survey showed that automated assessment, resulting in less "evaluative fatigue" on the teacher's side, while allowing more practice on the student's side, with immediate, multimodal feedback that is less ephemeral than in face-to-face situations.

Charroud Christophe *et al.* [9] have noted that the use of digital technology for assessment can have advantages and limitations. Among the advantages of this use, students can access more immediate and lasting feedback, teachers to sometimes richer and objective information. Among the disadvantages is the vague concept of "personalization", which is often difficult to resolve with increased risks of misuse of personal data and surveillance. In the same sense Brown, G. T. L. [20] studied the impact of the Covid 19 pandemic crisis on the way of teaching and learning. He added that computer bugs, lack of equitable access as well as dehumanization are among the limitations of remote assessment.

Yerly and Issaieva [11] analyzed the evaluative practices implemented in a crisis situation in the postsecondary sector during a particular semester. This analysis showed that, in the face of the pedagogical disruption caused by the exceptional and unprecedented nature of the health crisis, there were many complex constraints and challenges to be met at the technological, professional, emotional and social levels. These researchers observed, at the beginning of the crisis, in the face of shock and urgency, a certain destabilization, even discouragement in some cases. But the teachers did not lose sight of their educational mission and did not give up. The pandemic situation was an opportunity for teachers to (re)think their evaluation, to experiment and to innovate. The situation showed, according to these researchers, that teachers are capable of exercising reflection in an emergency to ensure quality teaching and evaluation in these exceptional and new conditions. In many of the situations observed, these reflections have taken concrete forms in the development of evaluative approaches and tools, either individually or collaboratively. These researchers still observed a strong desire to support students through assessment on a cognitive, but also social and affective level.

In Morocco, an evaluative study was conducted by the

National Evaluation Authority with the Higher Council, in partnership with UNICEF. This study analyzed the unprecedented experience of distance learning imposed by the Covid-19 pandemic. Its main objective is to identify practices, opportunities and new pedagogical challenges related to the crisis. This study also collected and examined, through a quantitative survey, the views of 386 school teachers and their perceptions of the pandemic. It also examined, through a qualitative survey, the reactions and behaviors of teachers and students to the impact of the pandemic on education in general, and on distance education in particular. The qualitative survey consisted of collecting data from teachers and students through the organization of 14 focus groups divided into ten focus groups with teachers and four focus groups with students. The number of participants in the focus groups organized during the qualitative phase reached 158 people (108 teachers and 50 students).

The results of this evaluative study showed that a revival of education with students in the classroom is needed. These results confirmed that to make it through the great upheaval caused by the pandemic and successfully return to normalcy, it would take exceptional commitment and consistent decision making on the part of those in charge, accompanied by effective leadership on the part of school principals, committed teachers, and the involvement of all educational stakeholders, to prevent an entire generation from being deprived of its level of education and ending up in the future being referred to as the "Covid-19 Generation.

These earlier and later national and international studies have shown that e-learning, imposed by the Covid-19 pandemic, has brought many benefits for teaching and for assessment. Nevertheless, it faces several pedagogical, technological, professional, emotional and social obstacles and barriers. Despite the progress made in distance learning training and assessment, the docimological problems related to the validity, reliability, security and credibility of distance certification assessments as well as the problems of isolation, motivation and boredom during distance learning remain.

It is clear from the results of this preliminary national and international research that distance teaching and assessment, during the Covid 19 pandemic, could have been an excellent gateway for reflective practice and professional development of teachers. Nevertheless, the logistics of distance education and the adjacent pedagogies seem to be unknown to these teachers, it seems difficult for them to adapt to new ways of ensuring exclusively distance education. It is impossible for every faculty member to suddenly become an expert in online teaching and learning in the situation of this health crisis.

After analyzing educational and evaluative practices implemented nationally and internationally in times of crisis, we found that the most frequent research examined the experience of distance teaching and evaluation in the field of education, primary, secondary and higher education. While research in the areas of distance learning and assessment in pre-service and continuing education is very scarce.

In this regard, it seems appropriate to identify, through the perceptions of trainers (pedagogues, didacticians and education professionals) and trainee teachers, the impact of the Covid 19 pandemic on the proper conduct of training and evaluation of distance training in teacher training centers.

Since the CRMEFs are Moroccan institutions for teacher training of prospective teachers, their mission is to provide pre-service and in-service professional training for teachers. To ensure a successful distance teacher training and distance assessment, it would be important to focus more on the practices, tools, challenges and constraints of distance training and evaluation in the CRMEFs in times of health crisis, to study more closely the expectations and needs of teacher trainees and teacher trainers in CRMEFs.

The specificity of our problem lies in the category of the population of our learners. Indeed, their age varies between 21 and 40 years old and are future teachers who will be operational in 2020/2021. They will therefore be required to teach and evaluate at a distance because national and international forecasts have no visibility after the Covid 19 pandemic and the return to classic face-to-face teaching and evaluation methods. These future teachers are capable of making the necessary some efforts to adapt to the learning and assessment conditions imposed by this health crisis.

Given that distance learning training and evaluation within the CRMEFs can constitute a real renewal in our training engineering, to allow pedagogical actors to exercise reflection, to help teacher trainees adopt and/or adapt teacher training practices, to help trainers to pursue their pedagogical practices with much more confidence and conviction even in difficult and unpredictable situations such as those imposed by the Covid 19 health crisis. To achieve the research objectives mentioned above, two questionnaires were used. One administered for CRMEF trainers and the second was administered to the teacher trainees belonging to the 2020 cohort.

We therefore propose to answer the following four research questions:

- During the COVID 19 pandemic, what practices, tools, and pedagogies have been adopted by the CRMEF trainers when training and evaluating online learning ?
- What are the advantages and limitations of online training and evaluation of learning within the CRMEF ?
- What are the difficulties encountered by the two pedagogical actors (trainers and teacher trainees) during the training and evaluation of distance learning ?
- What are the expectations and needs of the two pedagogical actors (trainers and teacher trainees) for successful online training and evaluation over time ?

III. Materials and Methods

The methodology we adopted was based on three elements:

- An analysis of previous research works cited mainly in our bibliography.
- A brainstorming with the heads of departments of the CRMEF Fez-Meknes and with teacher trainees responsible for groups of different specialities.

This brainstorming took place face-to-face, in June 2020, with 8 heads of CRMEF departments, departments of Mathematics, Physics, Life and Earth Sciences, Arabic, French, English, History Geography and Computer Science

and with 8 teacher trainees responsible for groups in each department. This brainstorming focused mainly on the barriers to the development of distance training and distance evaluation within the CRMEF Fez - Meknes. This brainstorming was a support point for the realization of our two paper – based questionnaires, which deal in depth with the impact of the Covid -19 pandemic on the smooth running of training and the evaluation of distance learning in the CRMEFs.

A. The Development Preparation of Questionnaires

1) Questionnaire No.1 intended for trainers

Our first questionnaire (link below) includes 36 items, focusing mainly on:

- Practices and tools used during distance training and assessment.
- The benefits of distance learning training and evaluation.
- Obstacles and difficulties encountered by trainers from different departments of the CRMEF Fez-Meknes during training and evaluation of distance learning.
- The needs of these trainers to ensure a complete initial training online and to evaluate the training of the prospective teachers with much more confidence and conviction even in difficult and unpredictable situations.

Link of the first questionnaire:

https://drive.google.com/file/d/1DnrNEaU8GNv8SwPwGGmBynIbSACxKJJ9/view?usp=sharing

2) Questionnaire No. 2 addressed to teacher trainees of the 2020 cohort.

Our second questionnaire (link below) includes 19 items, and focuses more on:

- The methods or pedagogies used by trainers during distance training.
- The degree of interaction, feedback and reciprocal questioning between the trainer and the trainee teacher during the distance training.
- The degree of interaction between teacher trainee of the same group or specialty when conducting group or collaborative activities from distance.
- Obstacles to the development of distance training and evaluation within the CRMEF Fez during the period of Covid 19 confinement.
- Proposals suggestions from teacher trainees to improve training and evaluation of distance learning.

Link of the second questionnaire:

https://drive.google.com/file/d/1FZ-zGItijlcjjV7FV98QDYzouqem6yvG/view?usp=sharing

Our two paper questionnaires were administered in person, in July 2020 and July 2021.

In order to enlarge the sample, we made the online version of the questionnaires freely available to trainers and teacher trainees. Our study population comes from the CRMEF Fez Meknes, it includes 46 teacher trainees of two specialties French and English and 20 trainers with several years of experience in the field of teaching and training. These trainers were of different specialties (French, Life Sciences and Earth, Mathematics, Computer Science, Chemistry and Didactics).

Quantitative and qualitative statistical analyses were performed using IBM SPSS Statistics version 28.

A Likert-type scale composed of 3 modalities ranging from 1 to 3: (1 = Never, 2 = Occasionally, 3 = Very often) was used to identify online teaching practices as well as the pedagogies adopted by the trainers during the period of forced distance learning imposed by the Covid 19 health crisis.

A second Likert-type scale composed of 3 modalities ranging from 1 to 3: (1 = Not satisfied, 2 = Moderately satisfied, 3 = Perfectly satisfied) was used to identify the perceptions of the CRMEF trainers on the advantages and limitations of online training and distance evaluation during the period of confinement.

IV. Results and Discussion

Our study is divided into two sections. The first section makes it possible seeks to elicit the participants' perceptions, the advantages and limits of distance training, in the CRMEFs, during the pandemic. The second section will present our detailed study which consists of determining the practices, tools, opportunities and constraints of online learning assessment during the Covid 19 pandemic. It also attempts to discover the needs of CRMEF trainers to continue their pedagogical practices and evaluate the learning of future teachers with much more confidence and conviction even in difficult and unpredictable situations. Our study will highlight strengths and identify weaknesses in order to promote CRMEF trainers' and trainees' practices.

Before starting the two representative sections of our study, we will first check if our scale is faithful enough to be used in our questionnaires.

A. Scale Validation

In our study, it appears essential to ensure the validity and reliability of the data collection instruments. Cronbach's alpha, equal to or greater than 0.7, was the threshold for internal consistency. As illustrated in Table I, II and III, the data collection instruments in our study passed the validity test with a significant degree of internal consistency (a Cronbach's α) that exceeds 0.70.

1) Validity and reliability of the scale used in the questionnaire N°1 for the CRMEF trainers

TABLE I: Validity of the Measurement Model on Trainers' Perceptions of the Benefits and Limitations of Distance Training During the Covid 19 Pandemic in the CRMEF

Research construction	Code	NB.Items	Observations	Scale used	Mean	Standard Deviation	Variance	Cronbach's Alpha
Online teaching practices during Covid 19	Q8-1_P1	11	Valid = 20 Excluded = 0	[1 = Never, 2 = Occasionally, 3 = Very often]	2.00	1.026	1.053	0.727
	Q8-1_P2				2.20	1.005	1.011	
	Q8-1_P3				2.00	1.026	1.053	
	Q8-1_P4				2.20	1.005	1.011	
	Q8-1_P5				1.90	1.021	1.042	
	Q8-1_P6				2.40	0.940	0.884	

	Q8-1_P7				2.10	1.021	1.042	
	Q8-1_P8				2.10	1.021	1.042	
	Q8-1_P9				1.90	1.021	1.042	
	Q8-1_P10				1.90	1.021	1.042	
	Q8-1_P11				2.10	1.021	1.042	
Benefits of online training during « Covid 19 »	Q12_P1	5	Valid = 20 Excluded = 0	[1 = Not satisfied,, 2 = Moderately satisfied, 3 = Perfectly satisfied]	1.40	0.821	0.674	0.744
	Q12_P2				1.60	0.940	0.884	
	Q12_P3				1.20	0.616	0.379	
	Q12_P4				1.30	0.733	0.537	
	Q12_P5				1.40	0.821	0.674	
Limitations of online training « Covid 19 »	Q13_P1	3			1.60	0.940	0.844	0.716
	Q13_P2				2	1.026	1.053	
	Q13_P3				2.20	1.005	1.011	

TABLE II: VALIDITY OF THE MEASUREMENT MODEL ON TRAINERS' PERCEPTIONS OF THE BENEFITS AND LIMITATIONS OF DISTANCE EVALUATION DURING THE COVID 19 PANDEMIC IN THE CRMEF

Research construction	Code	NB.Items	Observations	Scale used	Mean	Standard Deviation	Variance	Cronbach's Alpha
Benefits of online assessment during Covid 19	Q33_P1	11	Valid = 15 Excluded = 5	[1 = Not satisfied, 2 = Moderately satisfied, 3 = Perfectly satisfied]	2.33	1.952	3.810	0.716
	Q33_P2				1.00	0.00	0.00	
	Q33_P3				1.80	1.656	2.743	
	Q33_P4				2.60	2.028	4.114	
	Q33_P5				1.27	1.033	1.067	
	Q33_P6				2.87	2.066	4.267	
	Q33_P7				1.27	1.033	1.067	
	Q33_P8				1.27	1.033	1.067	
	Q33_P9				2.07	1.831	3.352	
	Q33_P10				2.33	1.952	3.810	
	Q33_P11				2.07	1.831	3.352	
Limitations of the online assessment during Covid 19	Q34_P1	10			4.73	1.033	1.067	0.727
	Q34_P2				2.07	1.831	3.352	
	Q34_P3				3.67	1.952	3.810	
	Q34_P4				2.87	2.066	4.267	
	Q34_P5				2.33	1.952	3.810	
	Q34_P6				2.87	2.066	4.267	
	Q34_P7				2.07	1.831	3.352	
	Q34_P8				2.60	2.028	4.114	
	Q34_P9				2.33	1.952	3.810	
	Q34_P10				3.13	2.066	4.267	

2) Validity and reliability of the scale used in the questionnaire N°2 for teacher trainees of the CRMEF

TABLE III: VALIDITY OF THE MEASUREMENT MODEL ON TEACHING PRACTICES AND PEDAGOGIES ADOPTED, DURING DISTANCE EDUCATION IN THE ERA OF THE COVID 19 PANDEMIC

Research construction	Code	NB.Items	Observations	Scale used	Mean	Standard Deviation	Variance	Cronbach's Alpha
Teaching practices during distance training.	Q9_P1	3	Valid = 46 Excluded = 0	[1 = Never, 2 = Occasionally, 3 = Very often]	3.00	0.00	0.00	0.750
	Q9_P2				1.48	0.863	0.744	
	Q9_P3				1.48	0.863	0.744	
Pedagogy adopted during the online training	Q10_P1	4			2.17	0.996	0.991	0.701
	Q10_P2				2.17	0.996	0.991	
	Q10_P3				2.43	0.910	0.829	
	Q10_P4				2.87	0.499	0.249	

B. Section 1: Online Training within CRMEFs, during the Period of Covid-19 Confinement

The pre-service training for prospective teachers is provided by 15 CRMEFs. The CRMEFs welcome teacher trainees who have a Baccalaureate + 3, aged between 21 and 40 years. To access the CRMEF, the teacher trainees must have at least a Bachelor degree in a specific specialty and pass a written and oral exam.

The decree creating the CRMEFs (2011) limits the duration of training to one year in two complementary spaces, the CRMEF and the school, at the rate of 26 hours per week. The organization is based on the three school cycles (pre-school-primary; college; qualifying). This training is sanctioned by a "certificate of educational qualification".

From a pedagogical point of view, the architecture of the training system is based on three fundamental principles: the competency-based approach with a modular architecture; the practice – theory - practice paradigm based on professional activities and situations, which reinforce professionalization through 60% of the hourly mass allocated to training and reflective practice. In this section, we address two parts, the first brings together the practices, tools and perceptions of CRMEF trainers on e-learning during Covid 19, the second brings together the opinions and needs of teacher trainees of 2020 cohort.

1) Part 1: Opinions and perceptions of CRMEF trainers on e-learning during Covid 19

a) Practices, tools and teaching methods used by the CRMEF trainers

The Covid-19 pandemic allowed CRMEF trainers to rethink and develop their pedagogical practices. The face-to-face training within the CRMEFs has been

transformed into distance training between trainers and future teachers.

The results of our investigation (questionnaire No. 1) clearly showed that 50% of the trainers questioned had already provided online teaching sessions before Covid-19, while all the trainers (100%), who provided online teaching sessions for the benefit of future teachers during this period of the Covid-19 pandemic. All the trainers questioned exercise their professions within the CRMEFs.

Table IV represents personal and professional information (Gender, Age, Disciplinary field, Years of experience, ICTE Qualifications) on the 20 trainers interviewed.

TABLE IV: PERSONAL AND PROFESSIONAL INFORMATION OF TRAINERS

Demographic Characteristics	Nb.Cit	Freq.
Kind		
Men	15	75%
Women	5	25%
Age		
25 to 30 years old	0	0%
31 to 40 years old	0	0%
41 to 50 years old	11	55%
Over 50 years old	9	45%
Disciplinary field		
French	5	25%
Life and earth sciences	5	25%
Mathematics	4	20%
Computer science	3	15%
Didactic	2	10%
Chemistry	1	5%
Years of experience		
Under 4 years old	1	5%
From 4 to 6 years old	0	0%
From 6 to 8 years old	0	0%
From 8 to 10 years old	10	50%
From 10 to 12 years old	4	20%
From 12 to 14 years old	0	0%
More than 14 years old	5	25%
Qualification_ICTE		
Passionate	3	15%
Interested	15	75%
Doubtful	2	10%
Refractory	0	0%

As shown in Table IV, the trainers questioned come from various disciplinary fields (French, Mathematics, Computer science , Didactics, Chemistry, etc.), 70% of them have a professional experience that exceeds 8 years, 25% have more than 14 years of experience in the field of education and training.

These trainers interviewed are interested (75%) or even passionate (15%) about the use of Information and Communication Technologies in Education (ICTE). They are skilled with technology and resistant to monotony. They have all provided (100%) with the means at their disposal and with the technological skills they have, an online training for the benefit of teacher trainees (future teachers) during the period of the Covid 19 pandemic.

During the period of this health crisis, online training was provided by the following tools (Table V).

TABLE V: TOOLS USED BY TRAINERS DURING THE ONLINE TRAINING

Means_used_online_training_COVID 19	Nb.cit.	Fréq.
Video conferencing tools (Zoom, Skype, etc.)	7	35%
Social networks (Facebook, WhatsApp…...)	16	80%
Email (Outlook, Gmail, Yahoo…..)	13	65%
Google applications (Google Meet, Google Classroom, Google drive….)	9	45%
Teaching platform (Teams, e-Takwine, Moodle)	3	15%
Others	2	10%

Table V clearly shows that the trainers mainly used social networks (80%), e-mail (65%), Google applications (45%) as well as videoconferencing tools (35%), while few trainers (15%) used distance learning platforms. This marginal use of distance learning platforms is due to the problem of accessibility and confidentiality according to the majority of trainers.

Lebrun [21] studied the pedagogical impact of an e-learning platform on student learning and on the professional development of higher education teachers. He concluded that, in order to develop skills, through an e-learning platform, training in the method or usage, for both pedagogical actors (teachers and students), is essential and a validation of the developed skills is necessary. In the same direction, Villessèche *et al.* [17] developed an adaptive e-learning platform that improves the skills of learners from primary school to university. These researchers stated that the development of this platform has offered new possibilities, particularly in terms of pedagogical and research scenarios that target the development of individualized transversal skills.

For beneficial use of distance learning platforms, CRMEF trainers should take advantage of continuous training to learn how to use the teaching platforms already in place as well as to design, develop and expand new adaptive platforms for online training.

The results in Table VI clearly show that the trainers of the CRMEF have diversified their pedagogical practices during distance training of future teachers.

These results reflect that the shift to distance learning during the Covid-19 pandemic indeed offers new ways of training and learning. It allowed the majority of trainers to rethink and develop their practices towards distance learning in synchronous (25%), asynchronous (50%) and hybrid (60%) mode (Table VII).

TABLE VI: PRACTICES USED DURING THE ONLINE TRAINING

Practice_online_training_during_Covid 19	Code	1.Never	2.Occasionally	3.Very often
-Stream the course live.	Q8-1_P1	10 (50%)	0%	10 (50%)
-Submit a digital course	Q8-1_P2	8 (40%)	0%	12

material.				(60%)
-Disseminate additional resources during the course.	Q8-1_P3	10 (50%)	0%	10 (50%)
-Share audio/video media.	Q8-1_P4	8 (40%)	0%	12 (60%)
-Share relevant educational resources available on the web.	Q8-1_P5	11 (55%)	0%	9 (45%)
-Discuss and collaborate with groups of trainees using social networks (Facebook, WhatsApp….).	Q8-1_P6	6 (30%)	0%	14 (70%)
-Help trainees to carry out their own work.	Q8-1_P7	9 (45%)	0%	11 (55%)
-Correct sets of exercises.	Q8-1_P8	9 (45%)	0%	11 (55%)
-Guide and supervise teacher trainees in their research projects.	Q8-1_P9	11 (55%)	0%	9 (45%)
-Prepare teacher trainees for exams.	Q8-1_P10	11 (55%)	0%	9 (45%)
-Evaluate the productions of teacher trainees.	Q8-1_P11	9 (45%)	0%	11 (55%)

TABLE VII: TEACHING METHOD USED DURING THE ONLINE TRAINING

On-line_Teaching_mode_during_COVID 19	Nb.cit.	Fréq.
Synchronous distance learning (live: videoconference).	5	25%
Asynchronous distance learning.	10	50%
Mixed distance learning (videoconference + asynchronous activities and online resources).	12	60%
Total OBS.	20	

Our results are close to the work of Deaudelin *et al.* [22] who showed that the exploitation of technology is likely to provoke changes in teachers' practices, attitudes and beliefs. In the same vein, the work of Gilles and Charlier [18] proved that the different digital means make it possible to observe the learners' path longitudinally. Adding to this the work of Charroud *et al.* [9] who announced that the transition to digital technology has many "technical" advantages for training and for evaluation.

In addition to this, all the trainers questioned (100%) declared their dissatisfaction with the material conditions (Wireless coverage, Teaching materials, etc.). Despite these obstacles, the majority of these trainers (60%) devoted between 5 and 10 hours of their time to produce, digitize and distribute an online course (Table VIII). These results imply a strong commitment and willingness on the part of the CRMEF trainers during this period of forced distance learning.

TABLE VIII: PREPARATION TIME FOR ONLINE COURSES

Online_course_preparation_time	Nb.Cit	Fréq.
No response	1	5%
More than 15 hours	3	15%
10 to 15 hours	0	0%
5 to 10 hours	12	60%
Less than 5 hours	4	20%
TOTAL OBS.	20	100%

b) The advantages and limits of distance learning according to CRMEF trainers

According to statements by CRMEF trainers, online training during the period of the health crisis presented advantages and limitations (Table IX).

TABLE IX : THE ADVANTAGES AND LIMITS OF DISTANCE TRAINING WITHIN CRMEFS

	Statements by CRMEF trainers	Code	1.not satisfied	2.moderately satisfied	3.perfectly satisfied
Advantages	Improve the efficiency and quality of the teaching-learning operation.	Q12_P1	16 (80%)	0%	4 (20%)
	Stimulate creativity.	Q12_P2	14(70%)	0%	6 (30%)
	Increase the motivation of future teachers.	Q12_P3	18(90%)	0%	2 (10%)
	To arouse the curiosity of future teachers.	Q12_P4	17(85%)	0%	3 (15%)
	Invite teacher trainees to observe, manipulate and reflect on the results of experiments.	Q12_P5	16(80%)	0%	4 (20%)
Limits	The lack of confidence among some future teachers to understand complex and difficult subjects on their own.	Q13_P1	14 (70%)	0%	6 (30%)
	The lack of pedagogical models on how to teach online in an engaging way.	Q13_P2	10 (50%)	0%	10 (50%)
	The lack of technical and educational support.	Q13_P3	8 (40%)	0%	12 (60%)

These favorable and unfavorable statements help us to deduce that the trainers did not have time to refer to the logistics of distance learning and this is due to the emergency of the transition that was imposed.

Practices inherited from face-to-face teaching tend to be perpetuated through distance learning [23] and this has had a negative influence on motivation, creativity, and the effectiveness and quality of the teaching-learning process.

Several reasons have been formulated to explain the limits of distance training within the CRMEFs such as: a weak collaboration in scripting, as well as a lack of technical and pedagogical support and the lack of pedagogical models on how to teach online in an attractive way.

In addition to these obstacles, Carayol *et al.* [24] added that the digitalization of the teaching activity presents many risks for the physical health (visual fatigue, musculoskeletal disorders, migraines, fatigue, etc.) and psychological health of teachers (feeling of exhaustion, stress, anxiety, isolation, …).

These obstacles have influenced the smooth running of the

distance learning, the trainers are obliged to reproduce online, in the teaching of some modules, the model of the traditional class. Despite these obstacles, the trainers were able to discover digital tools, discover new teaching methods, train themselves, ensure pedagogical continuity and keep in touch with the future teachers. In addition, they helped future teachers to maintain the achievements they had already developed during the first half of the year (consolidation, enrichments, exercises, etc.).

2) Part 2: Teacher trainees' opinions and perceptions of e-learning during Covid 19

a) Pedagogy adopted during distance training and degree of interaction between trainer and teacher trainees and between teacher trainees themselves

Our second questionnaire was intended for 46 teacher trainee of the 2020 cohort (including 30 men and 16 women) aged between 25 and 40 years old from two different specialties, French and English. During the second semester, these teacher trainees continued pre-service training online as imposed by the Covid 19 pandemic. The 8 modules devoted to the second semester were taught remotely during the confinement period and in asynchronous mode. An hourly volume of 34 hours has been allocated to each module, the training is spread over 10 weeks, 3 hours for the weekly teaching of each module, and 4 hours for the evaluation, namely 2 hours for the diagnosis evaluation at the beginning of the semester and 2 hours for the summative evaluation at the end of the semester which was carried out face-to-face after the end of confinement. This end-of-semester exam represents 75% of the validation grade of the module taught

The teacher trainee of the French and English specialty followed an online training in asynchronous mode through social networks (Facebook; WhatsApp; …), email (Outlook; Gmail; Yahoo…) and Google applications (Google Meet; Google Classroom; Google Drive…).

The trainers used these tools very often to upload digital course materials and sets of exercises and their answers (100%), to assess the achievements of trainee teachers (23.9%) and to provide feedback (23.9%). According to the trainees interviewed, the pedagogy most often adopted by their trainers during this online training was oriented and to a large extent towards group pedagogy with a rate (93.5%) and project-based pedagogy with a rate (71.7%). Other pedagogies were often used (competency-based approach and problem-solving approach) with a rate of 58.7%.

Similarly, the evaluations carried out remotely were mainly diagnosis and formative evaluations. These evaluations were in the form of a series of exercises (100%), reports (89.1%), diagnostic tests (67.4%), projects (56.5%), case studies (26.1%), presentations (19.6%), and quizzes (13%).

The results of our investigation have again shown that e-learning during Covid 19 did not promote, in 86.7% of the teacher trainees questioned, interactions, feedback and reciprocal questioning with their trainers, which caused in them a feeling of boredom and abandonment. These results help us to deduce that the tutoring function during this distance training did not find its place. The majority of trainers have deposited, via social networks, email and Google tools, course materials and series of exercises. Their main objective has been to ensure pedagogical continuity.

A teacher trainee stated that "One of the salient reasons, in my opinion, is that distance education is not yet taken seriously and only very limited use is made of it, shortening the face-to-face training, the majority of trainers are not familiar with e-learning". Another added, "Presentations, course materials and PDFs were not enough during distance learning, almost the integrity of distance learning sessions were without the physical presence of the trainer".

On the other hand, 87% of trainee teachers believe that this distance training has allowed interactions between other teacher trainees of the same group when carrying out collective or collaborative activities or group work.

It is clear, according to the statements of some respondents, that their trainers did not have the possibility and the time to plan and effectively manage this distance training imposed by the Covid 19 health crisis.

b) The difficulties encountered by teacher trainees in distance learning during the period of confinement

The qualitative analysis of the teacher trainees' responses to the obstacles to the development of e-learning during Covid 19 showed us that the barriers that influenced the smooth running of this distance learning were linked to the lack of motivation, reassurance, self-discipline, seriousness, concentration as well as the lack of interaction with the trainer, plus the absence of suitable working conditions, connection problems, reception problems, financial problems.

A trainee teacher announced the following statement: "There are those among us who do not have their own office, who live in shared flats or in noisy places... and therefore do not find suitable working conditions at remote". Another teacher trainee added: "There are those among us who cannot afford a good computer, others who do not have an internet connection or a network because they found themselves confined to the countryside far from the city…" Another claimed that "Following a course from home does not allow to feel the responsibility and decreases the concentration, the chances of distraction are high, which causes the abandonment of these courses, besides that in some courses we need to practice to understand, which was impossible with distance learning". Another announced: "It was an uncharted territory for most of the trainees as well as trainers (I assume), so it didn't feel natural/authentic and didn't allow us to be personally guided by our trainers as we needed. The majority of the time, we felt as if we were disconnected from the training and only had to submit the tasks to prove that we were attending our sessions".

These declarations of teacher trainees enabled us to release that the financial problems, the intellectual, emotional and social problems as well as the absence of interaction face to face with the trainers are among the major obstacles which influenced the good progress of the distance training within CRMEFs during the period of confinement due to the Covid 19 pandemic.

These results bring us closer to the work of Riadi [25] who studied Indonesian students' perceptions of online learning during the Covid-19 pandemic. These researchers stated that Indonesian students perceive their online learning experience

negatively. They are dissatisfied with the poor performance of the Internet and the high cost of Internet access.

In the same sense, Ouajdouni [26] evaluated the effectiveness of the e-learning solution during the Covid - 19 crisis in Moroccan public higher education institutions. The results showed that the degree of satisfaction of students towards the use of e-learning technology influences their performance and can increase their knowledge, and their autonomy.

These results bring us closer to the work of Riadi & al. [25] who studied Indonesian students' perceptions of online learning during the Covid-19 pandemic. These researchers stated that Indonesian students perceive their online learning experience negatively. They are dissatisfied with the poor performance of the Internet and the high cost of Internet access.

c) Distance learning within CRMEFs and the needs of teacher trainees

The qualitative analysis of the answers of the teacher trainees allowed us to discover their needs and their proposals in order to improve the training and the evaluation of distance learning within the CRMEFs.

The teacher trainees interviewed demand the establishment of platforms for distance training by varying the teaching methods (synchronous, asynchronous or hybrid) with weekly follow-ups from trainers through quizzes and forms. Similarly, regular organization of question answer sessions at least once a fortnight will allow future teachers to ask their questions and interact face to face with the trainer. This will be good for teacher trainees as well as trainers. Besides that, an elaboration on the part of the trainers, from time to time, of Zoom sessions between the future teachers of the same group and specialty proves to be a necessity among the teacher trainees questioned, this will ensure their interactivity and bring them out of their bubble, allow them to exchange ideas, make connections, communicate etc.

The analysis of the needs of teacher trainees has again shown that the latter strongly recommend the commitment of mentors to help them overcome their obstacles and regain the motivation lost due to the pandemic.

C. Section 2: The Evaluation of Distance Learning within CRMEF in the Era of the Covid-19 Pandemic

In the field of education and training, evaluation is an integral part of the teaching-learning process. It is one of the professional competencies targeted by training in CRMEFs. Tyler [27] considered that “Evaluation is essentially the determination of the extent to which the objectives of the curriculum are achieved”. This involves stating the aims and objectives of the curriculum; the taxonomic classification of objectives; the definition of behavioral objectives; the construction of valid and reliable assessment tools

For a relevant evaluation of distance learning, it is necessary to use new information and communication technologies as essential resources for the smooth running of this phase.

In general, the evaluation of teacher trainee learning within CRMEFs encompasses two dimensions. The first, formative, is part of the professional development of the teacher trainee through a diagnosis of his/her knowledge, skills and teaching practices to identify the points that require improvement. The second is summative and aims to evaluate the performance of the teacher trainee, during pre-service training, in order to make him/her accountable for his/her actions as a future teacher.

During the period of confinement of the Covid-19 pandemic, teacher trainees of different specialties of the 2019-2020 cohort continued pre-service distance training during the second semester from April to in July 2020. The evaluations carried out online for the benefit of these teacher trainees were mainly formative evaluations.

These teacher trainees took the validation exams for the second semester modules late in January 2021 and face-to-face, while in normal situations the end-of-training summative assessment takes place no later than mid-July.

The teacher trainee can only validate his pre-service training within the CRMEF after obtaining an overall mark greater than or equal to 10 in all the modules (16 modules in total) taught during the two semesters of the training year (8 modules the first semester and 8 modules the second semester). The overall validation score for each module is the average of the scores of the continuous assessment carried out during the training and the validation exam carried out at the end of each semester. The mark of the continuous checks represents a rate of 25% and the mark of the validation exam represents a rate of 75% of the overall mark of the validation of each module. The grade of the continuous assessment and the validation exam are part of a summative evaluation.

It should be noted that the majority of the trainers were not able to carry out the continuous distance controls which represent 25% of the validation grade of the taught modules and this is due to several obstacles and impediments. These trainers tried to count the formative evaluations carried out during the training as well as the rate of commitment, participation, attendance and application of the trainees during the online training as a mark of the continuous control. Some trainers asked teacher trainees to come in and take the face-to-face continuous assessments after the lockdown ended.

A remedial re-sit session takes place at the end of each year of training, to give a second chance to future teachers who have not validated one or more modules.

1) Tools, instruments and modalities used by CRMEF trainers during the online evaluation

The Covid-19 pandemic was a complex situation in terms of evaluation, the trainers of the CRMEFs also had to adapt their distance learning evaluation practices, both in their aim of regulation (formative evaluation) and in their certification aim (summative or certifying evaluation). Despite these difficulties and obstacles, this situation has allowed trainers to rethink, develop and expand the scope of their distance assessment practices.

In this section, we will identify the practices, tools, opportunities and constraints of online assessment within CRMEFs during the period of confinement due to the COVID 19 pandemic, as well as the needs of CRMEF trainers, to assess the achievements of their future teachers with much more confidence and conviction even in difficult and unpredictable situations.

The results of our investigation (questionnaire 1) show that among the 20 trainers questioned, 75% (15 trainers) evaluated the learning of their future teachers remotely during the period of confinement. These online evaluations were mainly formative evaluations with a rate of 93% (Table X).

TABLE X: TYPES OF EVALUATIONS CARRIED OUT REMOTELY WITHIN THE CRMEFS

Types_remote_assessment_carried out	Nb.Cit	Fréq.
Diagnosis assessments	6	40%
Formative assessments	14	93%
summative assessments	4	27%
Total OBS.	15	

The trainer-evaluators carried out diagnosis evaluations at the beginning of the online training. These diagnosis evaluations generally focused on the knowledge and representations of the teacher trainee. The formative evaluations were carried out, for the most part, throughout the online training and this developed, in the trainer, a clear and regular vision of the acquisitions of the teacher trainees and the difficulties they encounter, in order to better adapt the learning offered. Summative online assessments in the form of graded tests were conducted by a minority of 27% of trainers at the end of online training to conclude learning.

These results demonstrate that the trainers of the CRMEFs considered remote evaluation, during this health emergency crisis, as a tool to support the training of their future teachers. These trainers have tried to adapt their learning assessment These trainers have tried to adapt their learning assessment practices, both in terms of regulation and certification. In most cases, they have carried out formative evaluations, the results of which make it possible to make a cognitive assessment of the learning of the future teachers being evaluated.

In the same sense, the work of Dick *et al.* [28] stated that formative assessment is the collection of data and information during instruction that can be used to examine the effectiveness of instruction. It must be conducted as part of instruction and occur while instruction is taking place. Whereas, summative evaluation is a collection of data that examines the effectiveness of instruction as a whole.

These researchers added that summative evaluations differ from formative evaluations. The main difference is the purpose of conducting an evaluation. Formative evaluations identify needed improvements during instruction, while summative evaluations identify strengths and improvements after instruction.

For the same reason, the work of Black and Wiliam [4] has shown that formative assessment has been a much more powerful lever for learning and teaching than certificative assessment, particularly through effective feedback effects. In addition, Barras and Dayer [14] concluded that the formative assessment implemented was an effective response to support students in a complicated period. Charroud Christophe & al. [9] added in their turns that the use of digital for formative assessment helps students to access more immediate and lasting feedback, teachers to sometimes richer and objective information.

Cross-tabulation Table XI clearly illustrates that 93% of all trainers who evaluated the learning of future distance teachers carried out, in majority, formative evaluations from 2 to 5 times to several times (approximately 87%). While about one third (1/3) of all evaluators conducted diagnostic evaluations 2 to 5 times to several times. In contrast, only one-fifth of the raters successfully completed summative assessments.

The assessments conducted overall were individual online assessments of the teacher trainee's work as well as online assessments of the work of groups of teacher trainees.

TABLE XI: THE NUMBER OF REALIZATIONS OF EACH TYPE OF EVALUATION DURING THE PANDEMIC

Nb_times_online_evaluation / Types_remote_assessment	Once	From 2 to 5 times	From 5 to 10 times	Several times	Total
Diagnosis assessments	7%(1)	7%(1)	7%(1)	20%(3)	40%(6)
Formative assessments	7%(1)	40%(6)	7%(1)	40%(6)	93%(14)
summative assessments	7%(1)	0%(0)	0%(0)	20%(3)	27%(4)

Note: The values in the table are the number of citations for each pair of modalities.

The results of our investigation again showed that 53% of the evaluations carried out from distance were evaluations in an asynchronous mode (delayed), 40% were mixed evaluations (synchronous and asynchronous online evaluations) while only 13% were synchronous evaluations.

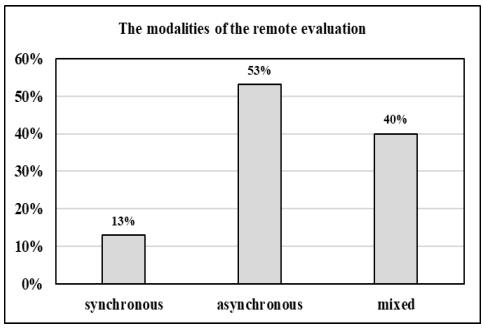

Fig. 1. Methods of evaluations carried out during the pandemic.

The evaluators carried out the evaluations of the learning of the future teachers using the following tools (Table XII):

TABLE XII: THE INSTRUMENTS OF THE EVALUATIONS CARRIED OUT

Online_assessment_tools	Nb.cit.	Fréq.
Final or end-of-semester exam.	0	0%
Oral exam	1	7%
Diagnosis test	5	33%
Practical work, experimentation	3	20%
Homework	7	47%
Quizzes	4	27%
Simulation	1	7%
Debate, discussion	1	7%
Exposed	7	47%
Case study, problem solving	1	7%
Report	6	40%
Project	5	33%
Total OBS.	15	

These results reflect a major investment and a strong

commitment of the trainers to distance assessment. Only 20% of the evaluators stated that these instruments and methods are not adequate for the learning objectives. This variety of instruments and modalities will help evaluators to follow the progress of those evaluated in a training process and this will undoubtedly motivate learning and encourage future teachers to progress.

The evaluators presented the instructions for distance evaluation in different formats (text, audio, image, video, etc.). The instructions for the evaluations carried out were mostly presented in text format (Table XIII).

TABLE XIII: FORMAT OF INSTRUCTIONS FOR EACH TYPE OF ASSESSMENT CARRIED OUT

Format_ assessment Types_remote_assessment	Text	Sound	picture	Video	Others
Diagnosis assessments	40%(6)	13%(2)	7%(1)	7%(1)	0%(0)
Formative assessments	87%(13)	40%(6)	13%(2)	20%(3)	7%(1)
summative assessments	27%(4)	13%(2)	13%(2)	0%(0)	0%(0)

Note: The values in the table are the number of citations for each pair of modalities.

The instructions for the assessments carried out remotely have been distributed online via the following media:

TABLE XIV: MEDIA FOR THE DISSEMINATION OF REMOTE ASSESSMENTS

Online_Assessment_Support	Nb.Cit	Fréq.
Website	0	0%
Forum	3	20%
E-mail	7	47%
Videoconferencing tools (Zoom, Skype, etc.)	3	20%
Teaching platforms (Teams, e-Takwine, Moodle)	0	0%
Google tools (Google Meet, Google Classroom, Google Drive...)	6	40%
Social networks (Facebook, WhatsApp, etc.)	10	67%
Total OBS	15	

The results in Table XIV clearly illustrate that the evaluators did not distribute the instructions for the remote evaluation via educational sites and platforms. They mainly used social networks, email and Google tools to disseminate these instructions. The teacher trainees took the online assessments individually and/or in groups in an uncontrolled setting. The evaluations carried out were generally formative evaluations and not summative evaluations because it is easier for the future teacher to plagiarize when administering the test.

TABLE XV: TIME ALLOCATED TO REMOTE EVALUATIONS

Time_allocated_online_assessment	Nb.Cit	Fréq.
Time limit for each question	3	20%
Time limited to the whole event	6	40%
Suggested time	2	13%
Without time fixing	8	53%
Total OBS.	15	

In the majority of cases, the evaluators asked the future teachers to solve the online evaluations in an uncontrolled context by limiting the time to the whole test or without a time limit (Table XV). These online assessments were not final or end-of-semester exams. More than 40% of the evaluations carried out were in the form of presentations, reports, and assignments, etc. (Table XII). In the same vein, Detroz *et al.* [8] announced that the adaptations provided for each online training course most often consisted of replacing written tests with remote oral exams or work to be submitted online, or even replacing terminal assessment through continuous assessment.

The main objective of the evaluators was to support the regulation of training during this crisis of forced distance learning. Almost all the evaluators corrected the remote evaluation papers themselves and manually (Table XIII). While according to Ryan *et al.* [19] automated correction can lead to less "evaluative fatigue" on the teacher side, while allowing more training on the student side, with immediate, multimodal feedback, less ephemeral than in situations in presence.

TABLE XVI: CONTRIBUTION TO THE CORRECTION OF EVALUATIONS

Contribution_correction_proofs	Nb.Cit	Fréq.
No response	1	7%
Former	13	87%
Peers	0	0%
Jury	0	0%
Automated correction	1	7%
Total OBS.	15	100%

When correcting the future teachers' tests, the trainers-evaluators used the following tools (Table XVII).

TABLE XVII: TOOLS USED DURING PROOFREADING

Tools_used_proofreading	Nb.Cit	Fréq.
Corrected version of the proof	8	53%
Accompanying book (solutionary)	0	0%
Correction grid	7	47%
Autocorrect tools	1	7%
Total OBS.	15	

As shown in Table XVIII, the evaluators adapted various scoring systems: numerical scoring systems, assessment systems as well as competency-based assessment systems:

TABLE XVIII: THE MARKING SYSTEMS ADAPTED DURING THE CORRECTION OF THE TESTS

Adapted scoring systems	Nb.Cit	Fréq.
A numerical grading system on a 20-point scale according to the work done by the future teacher.	6	40%
A numerical rating system on a 20-point scale according to the level of interaction of the future teacher and his level of intelligence.	1	7%
A system of assessments (excellent, very good, good, average, insufficient) according to the work done by the future teacher.	5	33%

A system of appreciations (excellent, very good, good, average, insufficient) according to the level of interaction of the future teacher and his level of intelligence.	3	20%
A system of evaluation by skills (acquired, in the process of being acquired, not acquired) with the establishment of a follow-up sheet for each future teacher.	3	20%
Others	1	7%
Total OBS.	15	

The evaluators submitted the results of the evaluations carried out via the following media:

TABLE XIX: METHODS OF DELIVERING RESULTS

Modality_delivery_results_on_line_evaluation	Nb.Cit	Fréq.
Teacher trainee portal	0	0%
E-mail	7	47%
Videoconferencing tools (Zoom, Skype, etc.)	1	7%
Forum	1	7%
Google tools (Google Meet, Google Classroom, Google Drive...)	7	47%
Teaching platforms (Teams, e-Takwine, Moodle)	0	0%
Social networks (Facebook, WhatsApp, etc.)	7	47%
Without replacement	1	7%
Total OBS	15	

The overall score obtained after evaluating the learning of future distance teachers represented, for the majority of evaluators, a percentage of 25% of the validation score for the module taught (Table XX). These results clearly confirm that the evaluations carried out remotely within the CRMEFs had as their main objective the support and regulation of the learning of future teachers, the constraint of awarding an overall mark with a high percentage which impacts the success or failure of future teachers has been ignored.

These results agree with the opinions of Barras and Dayer [14], Yerly and Issaieva [11] who announced that the formative assessment put in place was the most effective response to support students in this complicated period.

TABLE XX: THE PERCENTAGE OF THE OVERALL MARK OBTAINED DURING THE EVALUATIONS CARRIED OUT REMOTELY

Percentages_Rating_globle_remote_assessment	Nb.Cit	Fréq.
0% of teacher trainee pass mark	5	33%
25% of teacher trainee pass mark	10	67%
50% of teacher trainee pass mark	0	0%
100% of teacher trainee pass mark	0	0%
Total.Obs	15	100%

The results of Table XX show that among the 15 trainers who evaluated the learning of the distance trainees, 10 trainers (67%) gave the future teachers a mark which represents a percentage of 25% of the validation mark of the module taught. The mark awarded is part of the mark for continuous assessment. In addition, 5 trainer-evaluators (33%) did not reward the teacher trainees for the work done at a distance, which may be due to the high drop-out rate in online teaching in certain modules as well as the unreliability of the distance evaluation tools. The latter have asked the teacher trainee to come and take the continuous face-to-face tests after the lockdown.

It is worth noting that among the (67%) of the trainers evaluators who attributed to the evaluations carried out at a distance a rate of 25% of the validation mark of the module taught, only (40%) of them succeeded in carrying out the summative evaluations at a distance whereas the other trainers (60%) rewarded the teacher trainees according to the formative evaluations carried out at a distance as well as on the degree of participation, attendance and commitment of the trainees during the online training course.

These adaptations in the evaluation of online learning consisted mostly of replacing continuous assessments with assignments to be handed in online in an uncontrolled context in order to make a cognitive assessment of the learning of the future teachers evaluated.

2) The advantages and limits of remote evaluation within CRMEFs

According to the statements of the trainers of the CRMEFs, the online evaluation during the period of the health crisis presented advantages and limits (Table XXI).

TABLE XXI: THE BENEFITS AND LIMITATIONS OF DISTANCE ASSESSMENT WITHIN THE CRMEF

	Statements by CRMEF trainers	Code	1.not satisfied	2.moderately satisfied	3.perfectly satisfied
Advantages	Provide feedback.	Q33_P1	10 (67%)	0 (0%)	5 (33%)
	Make learning more realistic and meaningful.	Q33_P2	15 (100%)	0 (0%)	0 (0%)
	Facilitate collaborative production and interaction between future teachers.	Q33_P3	12 (80%)	0 (0%)	3 (20%)
	Review the performance of the teacher trainee.	Q33_P4	9 (60%)	0 (0%)	6 (40%)
	Adjust the course of the teacher trainee .	Q33_P5	14 (93%)	0 (0%)	1 (7%)
	Encourage teacher trainees who are the most discreet in class to take their place more.	Q33_P6	8 (53%)	0 (0%)	7 (47%)
	Follow the reasoning of the teacher trainee .	Q33_P7	14 (93%)	0 (0%)	1 (7%)
	Help the trainee teacher to prepare well for his exam.	Q33_P8	14 (93%)	0 (0%)	1 (7%)
	Assess understanding of content and adjust instruction.	Q33_P9	11 (73%)	0 (0%)	4 (27%)
	Evaluate learning progress.	Q33_P10	10 (67%)	0 (0%)	5 (33%)
	Develop interaction and mutual aid skills and break the isolation of teacher trainees.	Q33_P11	11 (73%)	0 (0%)	4 (27%)
	Infrastructure and equipment issues.	Q34_P1	1(7%)	0 (0%)	14 (93%)

Limits	Accessibility and confidentiality issues.	Q34_P2	11 (73%)	0 (0%)	4 (27%)
	The difficulties of detecting plagiarism and cheating from a distance.	Q34_P3	5(33%)	0 (0%)	10 (67%)
	Lack of time and lack of experience to train and assess future teachers at a distance.	Q34_P4	8 (53%)	0 (0%)	7 (47%)
	The lack of guarantees of safety and reliability of the tools.	Q34_P5	10 (67%)	0 (0%)	5 (33%)
	The lack of credibility of remote summative evaluation.	Q34_P6	8 (53%)	0 (0%)	7 (47%)
	Lack of institutional recognition of efforts to develop and promote remote assessment.	Q34_P7	11 (73%)	0 (0%)	4 (27%)
	The overload of the task of distance assessment for the teacher.	Q34_P8	9 (60%)	0 (0%)	6 (40%)
	Lack of training for future teachers in distance assessment.	Q34_P9	10 (67%)	0 (0%)	5 (33%)
	Lack of training for trainers in distance assessment.	Q34_P10	7(47%)	0 (0%)	8 (53%)

It is clear from our results that distance assessment helps trainers to assess the progress of their future teachers' learning. It makes it possible to identify the strengths and weaknesses of future teachers, to encourage them to become more confident and more communicative, to evaluate their progress, their performance and to provide feedback. Besides this, 67% of the evaluators confirmed that the future teachers have reached the expected cognitive level and are ready for the next year (Fig. 2).

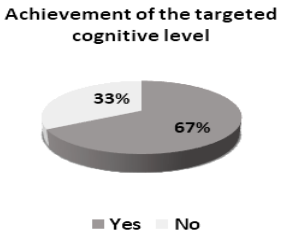

Fig. 2. Achievement of the targeted cognitive level during the Covid 19 pandemic.

Our results again indicate that remote evaluation has several limits and obstacles. Almost all evaluators (93%) state that infrastructure and equipment problems are among the major obstacles to a successful and continuous evaluation over time. In addition, other factors make remote evaluation very difficult. Examples include the following factors: inability to detect plagiarism and cheating when administering the test, lack of time and lack of experience to train and to conduct assessment from distance, lack of guarantee of safety and reliability of tools, lack of credibility of remote summative evaluation. Our results are in agreement with the work of Charroud Christophe *et al.* [9], Brown, G. T. L. [20] who announced that among the limitations of remote assessment is the vague concept of "personalization", which often remains difficult to solve with increased risks of misuse of personal data and surveillance. Add to that computer bugs, lack of fair access and dehumanization.

These results call for an improvement of distance summative evaluation procedures as well as the construction of valid and reliable evaluation tools.

V. Conclusion

This study has made it possible to elucidate, through the statements of teacher trainees and Moroccan trainers from CRMEFs, the advantages and limits of training and evaluation of distance learning during the period of confinement due to the coronavirus pandemic.

In terms of distance learning, the results showed that the obstacles to e-learning during Covid 19 were related to a large extent, according to the CRMEF trainers, to the lack of technical and pedagogical support as well as to the lack of pedagogical models on how to teach online in an attractive way. Despite these obstacles, the CRMEF trainers were able to discover digital tools, perceive new teaching modalities, develop some independence, ensure pedagogical continuity, and stay connected with future teachers. In addition, these trainers helped, to a large extent, the future teachers to maintain the skills already developed since the first semester of the year and to acquire new skills during the distance learning modalities.

However, for the successful development of the cognitive skills of future teachers, continuous training and technical and pedagogical support for trainers are necessary. These in-service training sessions should focus, first, on how to use the teaching platforms already in place, and second, on the design and development of new adaptive platforms for online training.

In addition to this, the teacher trainees of the 2020 cohort, in turn, stated that the barriers influencing the development of distance learning in the CRMEFs were related and to a large extent to the lack of motivation, comfort, self-discipline, seriousness, concentration as well as the lack of interaction with the trainer, adding to this the lack of suitable working conditions (connection problems, reception problems, financial problems). These obstacles led to a feeling of boredom which led to abandonment among many of the teacher trainees interviewed. To overcome these barriers and difficulties, these teacher trainees need their trainers to organize question answering sessions with face-to-face interaction, as well as Zoom sessions for the teacher trainees themselves to ensure and facilitate their interactivity. Teacher trainees recommend engagement of mentors to help them overcome their barriers and regain the motivation lost due to the pandemic.

In terms of distance learning assessment, our study has shown that distance learning assessment in the CRMEFs has brought about changes in attitudes and practices of trainers. The trainers interviewed carried out the evaluation of distance learning using different instruments and modalities (diagnostic test, quiz, assignment, project, presentation, report, etc.). However, the evaluations carried out at a distance were, in the majority of cases, formative evaluations with a rate of 93%. The main objective of these evaluations was to support and regulate the learning of future teachers.

In addition to this, the results revealed that distance

learning assessment in the CRMEFs had benefits and limitations. It helped trainers assess the learning progress of their student teachers, identified the strengths and weaknesses of the student teachers, encouraged them to become more confident and communicative, and assessed their progress and performance and provided feedback. Nevertheless, almost all of the evaluators (93%) stated that infrastructure and equipment problems are among the major obstacles to successful and continuous evaluation over time, in addition to the inability to detect plagiarism and cheating during the time of test administration, lack of time and experience to train and evaluate at a distance, lack of guarantee, security and reliability of the tools, and lack of credibility of the summative evaluation at a distance

These results require the introduction of digital tools and adaptive e-learning platforms that guarantee the validity, reliability and credibility of the evaluation. These tools will facilitate the evaluation and follow-up of the evaluated. Similarly, an improvement of the distance summative evaluation procedures seems indispensable. These procedures must be based essentially, and to a large extent, on the needs of the trainers, i.e. the availability of infrastructures and equipment, accessibility, confidentiality, security, the need for continuous training, motivation, technical support and institutional recognition.

In short, the consideration of distance training and evaluation during pre-service and/or in-service training remains a reality. The introduction of an innovative formative and evaluative approach will undoubtedly contribute to the success of the distance training and evaluation process even in difficult and unpredictable situations such as those imposed by the Covid 19 health crisis.

This work is a reflection carried out on the basis of a study conducted in an emergency. Its specificity lies in the category of the population of our trainees. Indeed, they are at least 22 years old and are future teachers who will be operational in 2020/2021. They will therefore be required to teach and evaluate at a distance. These future teachers are capable of making the necessary efforts to adapt to the learning and evaluation conditions imposed by this health crisis.

The Covid-19 pandemic period is indeed a fabulous opportunity to contribute even more, there is a need to evaluate the impact of artificial intelligence on the credibility and validity of the summative distance evaluation within the CRMEF.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

The authors confirm their contribution to the article as follows: Conceptualization: BG and NB; Methodology: BG and NB; Data collection: BG; Data analysis and interpretation: BG and NB; Writing and editing: BG and NB; All authors reviewed the results and approved the final version of the manuscript. All authors have read and approved the final manuscript

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