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OPEN AND DISTANCE LEARNING IN THE INITIAL EDUCATION OF TRAINEE TEACHERS

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ABSTRACT *In light of empirical experience from Morocco, combined with new possibilities afforded by Information and Communication Technology (ICT), there is a wish to integrate new technologies into distance education to help solve a set of problems identified in the initial training at the Regional Centre for the Professions of Education and Training of Fez. The results of a study conducted among 71 trainee teachers of the Earth and Life Sciences allow us to conclude that Open and Distance Learning (ODL) could constitute a promising solution to address the many challenges linked to the initial training of teachers in Morocco. Finally, the trainee teachers' experience with ODL has also strongly contributed to their eagerness to integrate ICT in their subsequent teaching practices.*

KEYWORDS: ICT, Training Centre, Distance Education, Life And Earth Sciences, Trainee Teachers, Online Courses.

INTRODUCTION

The integration of Information and Communication Technologies (ICT) yields several benefits such as flexibility, accessibility, increased exchanges and interactions between the various parties, as well as a large variety of modes of teaching and learning (Karsenti, 2003). Indeed, ICT relocates, in time and in space, exchanges between teachers and learners, and therefore varies training activities (Peraya, 2005; Karsenti et al., 2007).

Technological innovations have engendered new tools that can be used in distance education, exploiting the possibilities afforded by multimedia and the Internet (El HAJ, 2004). Existing means have already transformed the teaching and learning system, culminating in "e-learning" (Karsenti, 2001). The e-learning system has facilitated exchanges and access to information and allowed the learner to adapt to the training process (Bouhaji et al., 2014). In addition, it has fostered interactivity, collaboration, individualization of learning pathways and self-evaluation by the learner (Perraton, 1992; Houze et al., 2004; Ayadi et al., 2009).

There have been numerous attempts to integrate ICT into the Moroccan education system: for example, the national charter of education and training (lever 10), the GENIE programme (launched in 2005 and revised in 2009), the Nafida project (2008), the emergency programme 2009-2013 (space 1, Project 10), the national homepage (taalimtice in 2011) the innovative teachers contest, VAREN project (2013), to name but a few.

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PROBLEMS

The Moroccan education system has undergone numerous reforms and several upgrading programmes to improve performance and the quality of teaching:

- The National Charter of Education and Training: Under lever 13 of the National Charter of Education and Training, it was agreed that school renewal depends on the commitment and the quality of teachers. Of course, here, "quality" in particular is dependent on good initial training (Dali, 2010).
  Article 134 of the charter stipulates that all training institutions shall be integrated at the regional level. This integration aims to mobilize all the potential available to assure a solid initial training of teachers and to reinforce pedagogical research in order to meet the requirements of improving the quality of education and training.
- The emergency programme: The reform of the initial training system for teachers was advocated by the emergency programme (between 2009 and 2012), through the project E3P1. Strengthening staff efficiency is based on various measures, among which is the creation of Education Classes at the University (ECU), which will mark out the career of the future teachers, while giving them solid, rich and very targeted training.
- The 2.11.672 decree**:** In accordance with Decree no. 2011 2.11.672, signed by the Prime Minister and published in the Official Bulletin of 2 February 2012, the Ministry of National Education (MNE) has created fifteen *"Centre Régional des Métiers d'Education et de Formation"* CRMEF (Regional Centres for the Professions of Education and Training) covering all the regions of Morocco.
- The CRMEF created as part of the measures to reform the system of initial training became operational from the school year 2012-2013. The MNE has developed and validated a reference frame relating to the initial training of trainee teachers (pre-school and primary, lower secondary and upper secondary).

However, many dysfunctions were identified at the level of CRMEF:

- The implementation of Education Classes in the *"Ecole Normale Supérieure"* (ENS) to develop disciplinary, interdisciplinary and preprofessional competencies (didactics of disciplines, sciences of education) suffered many delays and faced various obstacles (texts, framing, internships…). The ENSs were not initially established for this purpose.
- The heterogeneity of the trainee teachers' academic profiles (BA in ECU, BA in Fundamental Education and professional BA).
- Academic education remains inadequate and superficial, and therefore does not meet the pre-requisites of the fields of study at the level of these training centres.
- The duration of the training related to fundamental disciplinary teaching is inadequate. The reference frame has devoted 60% of the duration of the training to activities linked to professional qualification (in the educational institutions) and only 40% to theoretical activities (in the CRMEF). This short duration has resulted in weak appropriation of the academic contents.
- The distribution of the trainees at several schools and the fact that teachers are being trained to teach at different levels in professional situations mean the task of the CRMEF is very complicated.

Considering these dysfunctions, which negatively affect the quality and effectiveness of initial training as well as the norms of pedagogical quality that future teachers should strive for, we wondered if the use of Open and Distance Learning (ODL) could not constitute, at least partially, an efficient and promising alternative to overcome these shortcomings.

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Can the integration of ODL in the training of trainee teachers contribute to the improvement and enrichment of the quality of their training and their development of competences? Could such ODL training make up for the insufficiencies in the initial training within the CRMEF? Will the individual pace offered by online training, counterbalance the heterogeneity of the previous training of trainee teachers?

CONTEXT OF THE EXPERIMENT

The literature on the methods of pedagogic engineering is abundant (Alessi and Trolop, 2001; Drissi et al., 2006; Lablidi et al., 2009); however, the conception and implementation of ODL tools requires anticipation of the various difficulties and problems that the participants might face during training (El bachari et al., 2010). The design of ODL involves the following main steps:

- Prior study and definition of needs
- Identification of the technological environment
- Use of appropriate contents
- Development of learning situations
- The training itself
- Evaluation of benefits of the training

Each of the above-mentioned stages will present certain difficulties, according to its own specificity; and the actual training remains the most important stage, during which it is always necessary to listen attentively to the learners, to follow their progress, and to help them overcome any kind of difficulty: technical, methodological, pedagogical and others.

Objectives of ODL recommended to CMREF trainee teachers

Our open and distance education unit aims to achieve the following main goals:

- To improve the quality and effectiveness of the initial training of teachers of the Earth and Life Sciences discipline in the Moroccan CRMEF, and notably that of Fez.
- Resolve the problems ensuing from the heterogeneity among the trainee teachers, considering their previous academic backgrounds.
- To fill the possible gaps in the initial training provided at the CRMEF, resulting from the inadequate duration of the training in accordance with official authorities (Ministry of National Education).
- To motivate the trainee teachers to use ICT later in their job.

Target population

We conducted our experiment on a sample of 71 high school trainee teachers of the discipline of Life and Earth Sciences, representing three classes from the Fez CRMEF. All these trainees were registered in the Claroline platform and have received training on the integration of ICT in education.

Research process and contents of ODL

Our study has focused on the Claroline platform, first because access is free, second because it has functions that ensure all the pedagogical activities recommended during our training. Moreover, like other platforms of ODL, Claroline allows reallocation and the autonomous management of training time, and therefore an individual pace of knowledge building for our

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trainee teachers. Moreover, it provides a pedagogical environment that facilitates communication and exchanges between the trainer and the trainee teachers, mainly thanks to tools such as calendar, announcements, forums, work, etc.

The contents of the training were designed to supplement the initial training of the trainee teachers at the CRMEF of Fez, especially on matters related to the discipline of Life and Earth Sciences, which constitute the real needs of the trainee teachers –issues that cannot (or can only with great difficulty) be actually managed during their initial training.

So, two tools were used to define the needs of the trainee teachers:

- An evaluation in the form of a quiz via the exercise tool of the platform.

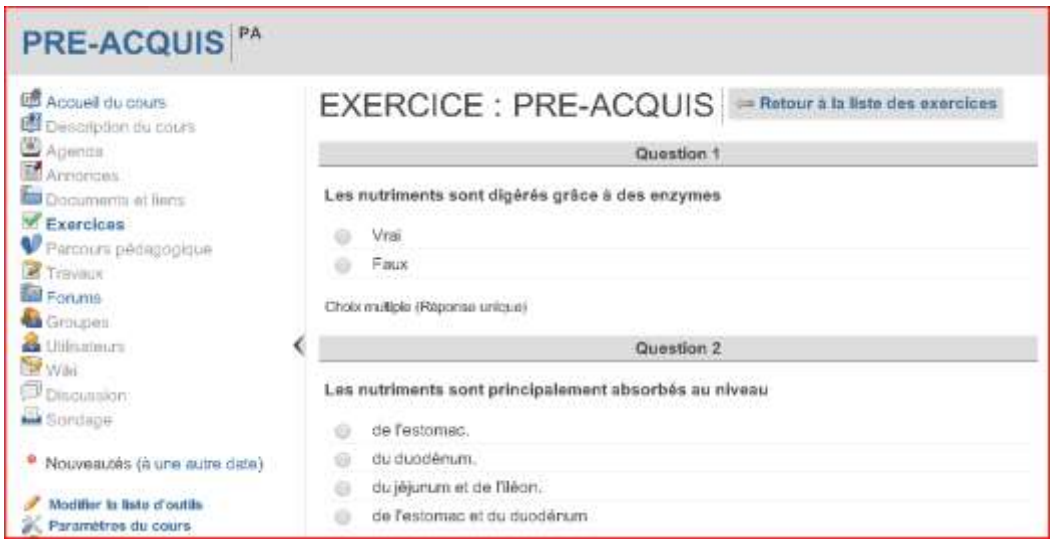

Figure 1. Capture of a screen page on the evaluation of knowledge

- A survey in the form of an online questionnaire on the pedagogical needs of the trainee teachers via the survey tool of the platform. It consists of presenting different proposals on pedagogical content from Life and Earth Sciences, from which the trainee teachers choose, according to their needs, from among four levels of importance, the one which corresponds best to those needs.

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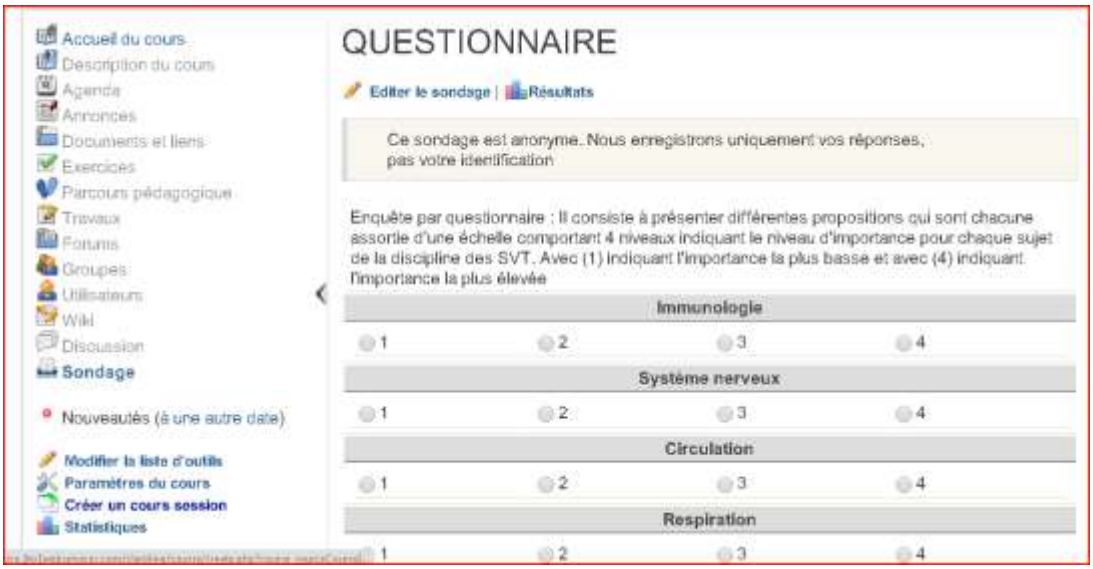

Figure 2. Capture of a screen page from the online questionnaire

Once the needs have been expressed, Life and Earth Sciences classes are structured and inserted gradually in the platform. This content was taught during the first semester of the academic year 2014-2015, at the end of which the trainee teachers were assessed.

METHODOLOGICAL ASPECTS

To resolve the identified problems and assess the choice of integration of ODL in the trainee teachers' education in parallel with their initial training as future teachers, we initially sought to evaluate the range of this choice with the trainee teachers themselves. We thus proceeded to a survey, through a questionnaire that we distributed to all the trainee teachers who had undergone the aforementioned distance learning. The questionnaire was handed out to the trainees, took 25 minutes to complete, and we had a 100% response rate.

The questionnaire was composed of targeted questions covering six topics:

- Topic 1: The academic profile of the trainee teacher.
- Topic 2: The availability of computer tools and the use of ICT by the trainee teacher.
- Topic 3: Elements raised by the trainee teacher about ODL in parallel with the initial training at the CRMEF.
- Topic 4: Technical difficulties encountered by the trainee teacher.
- Topic 5: The trainee teacher's degree of satisfaction with respect to the pedagogical objectives for the ODL.
- Topic 6: The trainee teacher's proposals and suggestions further to their experience of open and distance learning.

Once all the trainee teachers' answers to the questionnaire had been collected, the data were analysed using the software Sphinx, which was principally used to calculate the distribution of the modalities of the various questionnaire topics.

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DATA ANALYSIS AND INTERPRETATION OF RESULTS

Academic profiles of the trainee teachers surveyed

Our sample is composed of 71 trainee teachers from the Life and Earth Sciences discipline (33 men and 38 women); we therefore find that the sample is balanced in terms of gender. The majority of the trainee teachers are young: 93% are aged between 20 and 30 years, and only 7% are older than 30. There was broad variety in the diplomas and qualifications of the people in the sample: 60.3% have a BA in Fundamental Education, 7.4% have a Professional BA and only 32.4% have a BA in Education Classes at the University (ECU).

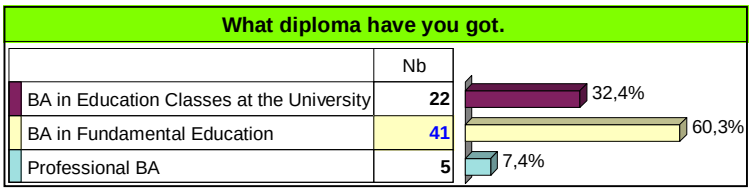

Figure 3. The trainee teachers' diplomas and qualifications

These results are very revealing as to the qualifications of the future teachers of Life and Earth Sciences at secondary level, in initial training at Fez CRMEF. A priori, these training centres were created to accommodate the laureates of *"Ecoles Normales Supérieures"* (ENS), i.e. holders of a BA in ECU. However, only one third of the candidates meet this requirement, whereas the remainder (two thirds) hold a university BA, and are a priori not intended for a job in education.

This account for the heterogeneity among the trainee teachers during their initial training at Fez CRMEF: It is therefore only natural that these candidates have different needs regarding content related to the Life and Earth Sciences discipline, since we know that the training at CRMEF does not cater for such needs. It was therefore completely legitimate that some trainees needed supplementary training customised to their needs on the contents of Life and Earth Sciences, in parallel with the initial training at CRMEF, without this representing an overload for the initial training provided at the CRMEF. ODL was an ideal solution to this problem.

Availability of the computer tools and use of ICT

The results show that 98.59% of the respondents have a personal computer and 80.88% have an internet connection. This reveals a generally satisfactory availability of the essential computer tools for the use of ICT by trainee teachers. As for their personal use of these ICT tools, the survey revealed that they concern mainly and primarily documentary searches, office tools and exchanges through social networks, but very little for personal entertainment (18.3% for online games).

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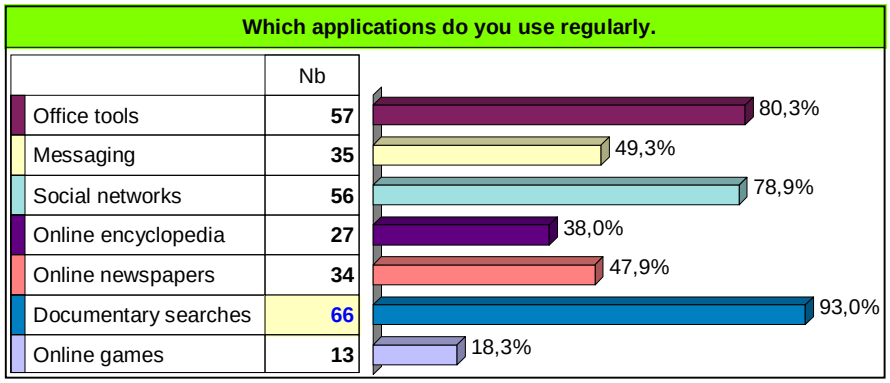

Figure 4. Personal use of ICT by the trainee teachers

Moreover the trainee teachers' mastery of ICT is generally good (81% have reported this). This result in itself represents a major asset for the initiated open and distance learning. Indeed, several researchers (El Akremi et al., 2003; Ong et al., 2004; Jawadi and El Akremi, 2006; Ong and Lai, 2006 and Ngai et al., 2007) underline the fact that sufficient mastery of the technology facilitates ODL and even encourages its use.

Supplementary advantages of the ODL to the initial training at the CRMEF

For this topic, we used 13 modalities, which represent the standard characteristics of ODL (see Table 1 below). Every modality was to be ranked from 1 to 4 according to the Likert, scale for which the trainee teacher must make no more than one choice: 1 for "completely agree", 2 for "partially agree", 3 for "partially disagree" and 4 for "completely disagree". The scores 2 and 4 were generally less represented in the almost all the modalities, so we therefore regrouped both scores 1 and 2 into a single modality "Agree" and scores 3 and 4 into the single modality "Disagree". The following table shows the responses in these two new modalities:

Table 1. Advantages of ODL in parallel with initial training

	Agree	Disagree	TOTAL
Autonomy in learning	85.1% (57)	14.9% (10)	100% (67)
Motivation and incentive to be more active	89.9% (62)	10.1% (7)	100% (69)
Interaction	76.1% (51)	23.9% (16)	100% (67)
Communication	80.9% (55)	19.1% (13)	100% (68)
Richness and diversity of resources	92.6% (63)	7.4% (5)	100% (68)
Self-assessment	91.3% (63)	8.7% (6)	100% (69)
Individual learning pace	79.4% (54)	20.6% (14)	100% (68)
Collaborative learning	73.1% (49)	26.9% (18)	100% (67)
Prolongation of length of training	78.8% (52)	21.2% (14)	100% (66)
Reducing the distance	89.7% (61)	10.3% (7)	100% (68)
Production and creativity	79.4% (54)	20.6% (14)	100% (68)
Quality of supervision	71.0% (49)	29.0% (20)	100% (69)
Solve the problem of heterogeneity within the group	71.0% (49)	29.0% (20)	100% (69)

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These results show that as a whole, on average, more than 80% of the trainee teachers agree with all standard criteria for the assessment of ODL. The criteria that have received very favourable assessment (80%) pertain to the richness and diversity of the resources, autonomy in learning, self-assessment, motivation and incentive to be more active, and finally reducing the distance for better communication. In fact, these criteria represent the very foundation of a good ODL. In this regard we can therefore conclude that the ODL initiated in parallel with the initial training of the trainee teachers was a complete success.

The other criteria are related to aspects such as pace and length of training, heterogeneity, collaboration and interaction within the group of learners, and finally the quality of the supervision. All these last criteria have still received favourable assessment (agree) from 70% to 80% of the trainee teachers. It is completely normal that these last criteria were slightly less appreciated by the learners than the fundamental criteria of ODL, because these criteria concern a teaching environment that is specific to an ODL, which the trainee teachers are not used to, since this was their first exposure to it.

Thus, on the basis of the trainee teachers' assessment, we can conclude that the use of ODL has allowed the majority of the trainee teachers to draw the pedagogical benefits that they expected from it, and that this remote training played a significant role for them in addition to their initial training. This result corroborates the fact that the trainee teachers were well aware of the benefits of ODL, as Lebrun (2012) rightly reports.

Technical Difficulties

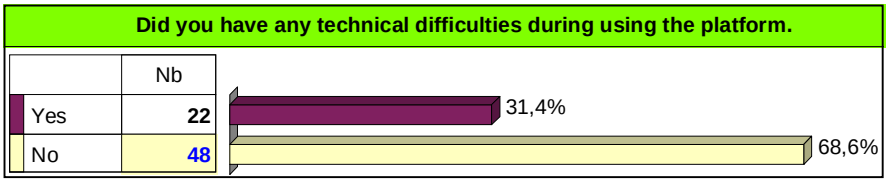

Figure 5. Technical difficulties encountered during the ODL

Two thirds of the trainee teachers (68.6%) stated that they did not have particular difficulties using the Claroline platform. The remaining third complained about the lack of familiarity with the learning environment, about connection to the server, and some bottlenecks. These difficulties, typically technical, are essentially due to the very modest accommodation facilities. This difficulty could possibly have been overcome if a more reliable host had been chosen and by setting up an online tutorial for platform use.

Level of satisfaction perceived by trainee teachers with respect to the achievement of the pedagogic objectives of ODL

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Table 1. Level of satisfaction of the trainee teachers with respect to the achievement of the pedagogic objectives of ODL

	Completely agree	Partially agree	Disagree	TOTAL
Usefulness of this training to acquire supplementary knowledge	38.2% (26)	51.5% (35)	10.3% (7)	100% (68)
Solve the problem of the insufficient duration	66.2% (45)	25.0% (17)	8.8% (6)	100% (68)
Heterogeneous profiles	40.3% (27)	41.8% (28)	17.9% (12)	100% (67)

The results indicate that the educational objectives of the ODL are fully achieved: 89.7% of the trainee teachers reported that they were satisfied with the usefulness of this training to acquire supplementary knowledge. (Note that this refers to supplementary material related to Life and Earth Sciences), 91.2% affirm that the ODL resolved the problem of the insufficient duration of the initial training provided by the CRMEF, and finally 82.1% of the trainee teachers maintain that ODL was an efficient means to overcome the problem of their heterogeneous profiles (only 3% completely disagree).

Furthermore, as figure 6 below indicates, at the end of this distance training, the vast majority of the trainee teachers (79.4%) felt that the platform has facilitated their learning, as it strongly contributed to the enrichment and improvement of the quality of their initial training at the CRMEF of Fez.

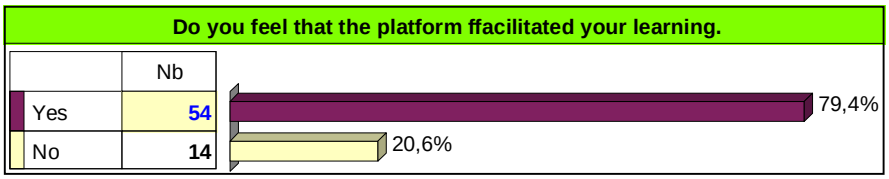

Figure 6. The trainee teachers' perception of added value in terms of learning thanks to the Claroline platform.

Finally, we have also noticed, at least in the sample of trainee teachers in our study, that gender, age, initial qualification or degree of ICT skills had no particular impact on the degree of motivation of these future teachers to integrate the latest ICT into their teaching, especially by the use of a platform for the benefit of the pupils: 91.2% state that they are strongly motivated to use a platform later during their teaching of Life and Earth Sciences with their students.

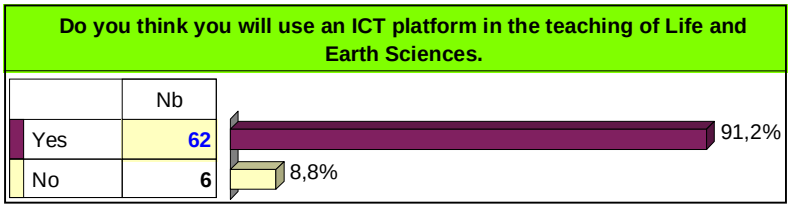

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Figure 7. Future teachers' motivation for the use of an ICT platform in their teaching

Thus, we are convinced that the use of ODL, experienced as positive by the majority of the respondents for its pedagogical impact, is in fact at the origin of the strong motivation of these trainees to integrate ICT into their future teaching work, and that most of them would quite simply wish to duplicate this same experience with their students.

Suggestions from the trainee teachers at the end of the ODL

The suggestions made by trainee teachers are summarized according to the four following points:

i. Improving the initiation into the ODL of the trainees for a more effective use of the platform during the distance learning.

ii. Improving the utilization of the platform functionalities, mainly at the level synchronous debates.

iii. Enriching and improving the contents of the distance learning by various resources: flash, video, etc.

iv. Generalization of ODL with other CRMEFs at the national level, for more sharing and exchange.

The trainee teachers' suggestions are not aimed at re-considering ODL as such; on the contrary, the trainees are requesting a more developed distance learning than the existing one on offer at CRMEF and suggest spreading distance learning to the whole of the CRMEF network at the national level, to take maximum advantage of the shared information and exchanges that this distance training offers. Moreover, at the end of this training, the trainees would have liked more diversified resources available on the platform, mainly those concerning digital resources like flashes and videos –a completely justified request in this kind of training environment.

These recommendations and suggestions are fundamental for a better preparation of future ODL intended for CRMEF trainees; on the one hand they will allow better targeting of the real needs of future teachers (Atsou et al., 2009) in addition to their initial training as teachers, and on the other hand make these learners more passionate about distance training (Goodhue et al., 1995; Rogers, 2003).

CONCLUSION

The starting point of this research was to find an efficient means that could supplement the initial education of trainee teachers at the CRMEF in Fez, in light of the fact that the profiles of the candidates entering this training centre were very heterogeneous, due to their previous training and academic qualifications. Direct supplementary face-to-face instruction was not possible, because the global teaching load at the Fez CRMEF was already stretched to the limits, and therefore distance learning represented an ideal and appropriate solution to this issue.

The ODL developed at the Fez CRMEF was the first experiment of its kind for the pedagogical team in charge of the training. The analysis of needs in terms of supplementary material on the pedagogical contents in Life and Earth Sciences, administered to trainees, as well as the results of the quiz which they carried out at the beginning of the ODL, were a fundamental source of information for the successful design and implementation of the content related to Life and

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Earth Sciences on the Claroline platform, as the teacher trainees expressed clearly during the final evaluation. Some 90% of them stated that ODL allowed them to fill their content gap in Life and Earth Sciences, while overcoming the difficulties relating to the heterogeneity of their previous academic education and to the very restricted duration of their face-to-face training within the CRMEF in Fez. In particular it allowed the trainee teachers to progress individually according to their real needs in terms of knowledge in Life and Earth Sciences, while respecting the learning pace of each one, in a learning environment which favours many exchanges and interactions between the stakeholders. This last point would not have developed solely by means of face-to-face teaching at CRMEF, while their future job as teachers will require them to master teamwork in connection with teaching progressions, or of follow-up of students' school life.

RECOMMENDATION

The success of ODL with trainee teachers at the CRMEF in Fez, conducted as a supplement to initial teacher training, was very conclusive; therefore, as suggested by some of the trainee teachers in their answers to the final questionnaire, the Ministry of National Education of Morocco ought to seriously consider introducing distance learning in all initial training of future teachers and to make it general in the form of ODL for all the CRMEF, mainly for disciplinary content.

This national generalization at the level of CRMEF will also, as indicated in the statements of our trainee teachers in Fez, sensitize Morocco's future teachers on the question of the integration of ICT in education, and thus allow Moroccan secondary education to integrate on more solid bases the digital era in fundamental teaching; because after all, it is initially and above all a question of teacher motivation for ICT to be integrated in our lower secondary and secondary schools!

REFERENCES

Alessi, S. M., & Trollop, S., R. (2001). Multimedia for Learning (3rd ed.). Boston: Pearson - Allyn & Bacon

Ayadi, F., & Kamoun, F. (2009). Les déterminants de l'utilisation du système e-learning par les étudiants. In Actes du 14e colloque de l'AIM.

Bouhaji, M., Mouddene, N. A., Benloubir, D., Serhier, Z., & Othmani, M. B. (2014). Perception de la formation à distance (e-learning) par les médecins internes du CHU Ibn Rochd de Casablanca, Maroc. Revue d'Épidémiologie et de Santé Publique, 62, S223-S224.

Dali, M. (2011). Le schéma directeur de la réforme de la formation initiale des enseignants au Maroc. Retrieved from http://www.deboecksuperieur.com/

Depover, C., Karsenti, T., & Komis, V. (2007). Enseigner avec les technologies: favoriser les apprentissages, développer des compétences. PUQ.

Drissi, M. M. H., Talbi, M., & Kabbaj, M. (2006). La formation à distance: un système complexe et compliqué. 4. (EPI). Retrieved from http://www.epi.asso.fr

El Akremi, A., Ben Naoui, N., & Gaha, C. (2003). Les déterminants d'utilisation de la formation électronique: approche par les théories d'adoption des technologies: analyse empirique dans le contexte tunisien. Actes du 14 ième Congrès de l'AGRH.

ISSN 2054-6297(Print), ISSN 2054-6300(Online)

El Bachari E., El hassan A. et El-Adnani M. (2010). Projet d'innovation techno pédagogique dans l'enseignement secondaire au Maroc : retour d'expérience. RADISMA, Numéro 6 (2010). Retrieved from http://www.radisma.info

El HAJ, L. (2004). Conception d'un support d'apprentissage interactif multimédia du cours «Biologie des végétaux vasculaires» (Doctoral dissertation, Institut Supérieur de l'Education et de la Formation Continue).

Jawadi, N., & El Akremi, A. (2006). Articles in French-II: E-learning Adoption Determinants: A Modified Technology Acceptance Model. Communications of the Association for Information Systems, 18(1), 2. Retrieved from http://aisel.aisnet.org/

Karsenti, T. (2003). Favoriser la motivation et la réussite en contexte scolaire: Les TIC feront-elles mouche. Vie pédagogique, 127, 27-32.

Karsenti, T., & Larose, F. (2001). TIC et pédagogies universitaires. Le principe du juste équilibre. Les TIC… au coeur des pédagogies universitaires. Sainte-Foy: Presses de l'Université du Québec.

Lablidi, A., Abourrich, A., Talbi, M. (2009). Démarche préconisée pour évaluer une plate-forme. (EPI). Retrieved from http://www.epi.asso.fr

Lebrun, M. (2012). Impacts des TIC sur la qualité des apprentissages des étudiants et le développement professionnel des enseignants : vers une approche systémique. Revue des Sciences et Technologies de l'Information et de la Communication pour l'Éducation et la Formation (STICEF), 18. http://sticef.univ-lemans.fr/

N gai, E. W., Poon, J. K. L., & Chan, Y. H. C. (2007). Empirical examination of the adoption of WebCT using TAM. Computers & education, 48(2), 250-267.

Ong, C. S., & Lai, J. Y. (2006). Gender differences in perceptions and relationships among dominants of e-learning acceptance. Computers in Human Behavior, 22(5), 816-829.

PERAYA, D. (2014). Distances, absence, proximités et présences : des concepts en déplacement. Retrieved from http://dms.revues.org

ISSN 2054-6297(Print), ISSN 2054-6300(Online)