

ICT Practice in Morocco's innovative teachers

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Abstract: The integration of Information and communication technology (ICT) in Moroccan schools forms one of the strategic levers of Ministry of National Education (MNE) to improve the quality of teaching and learning. Thus, the training teacher actions to the use of ICT in the classroom, the creation of institutional structures and the introduction of incentives for innovation in ICT accounted for the actions taken by the MNE to support teachers and help them to appropriate ICT tools and using them in their courses. Some teachers have more or less successful betting. This observation led us to question ourselves about the integration process of ICT which enabled them to distinguish themselves from the masses. The laid hypothesis is that the ICTs appropriation and their use in teaching practices is the result of a process that is located on a continuum ranging from non-use of ICT in their regular use.

Keywords: *ICT, appropriation, innovation, ICT integration, innovative teachers*

I. INTRODUCTION

The ICT enter the world of education and work. Their use requires knowledge, new skills and therefore the development of other routines in teaching and learning. Consequently, needed efforts are to deploy training capable persons to raise the innovation challenge that can negotiate the turn of the desired change. Thus, the Moroccan Educational System has focused on ICT for its potential benefit teaching and learning in order to make learning more attractive and to develop skills in information literacy and its modes of access and treatment. Therefore, the strategy of the Education Ministry, regarding the introduction of ICT at schools in particular, has focused on three different axes but complementary. It is the training, equipment and digital content. We mainly devoted this study from the latter axis representing the interest part in the action of teaching and learning.

II. PROBLEMATIC

If it's currently acquired, especially with Web 2.0, that the digital contents are accessed via the Internet and in large quantities, it does not remain less than their quality and adaptability are not always satisfactory and their integration is very slow [1]. Most teachers who use the Internet for pedagogical purposes, when they find resources, do not use them in class, these resources are in French or English and often incompatible with the Moroccan program. The teachers need to have available digital resources that are consistent with the learning objectives and consistent with the curriculum and existing programs. Then, the Ministry of National Education has initiated two actions:

The first consists of the creation of digital laboratory resources whose mission is the acquisition of

digital resources through private providers in international and national level.

The second encourages teachers to the production of digital content in the various disciplines and the best projects are awarded each year through a national competition called "Innovatice".

Only, it was found that during the seven years of the competition, the participation of teachers is very limited in terms of their workforce (more than three hundred thousand teachers). This leads us to the following question: Why some teachers do innovate teaching practices through ICT and other do not? The assumption is that the appropriation of ICT in teaching practice is the result of an integration process of ICT on a continuum ranging from non-use to a regular use one.

III. CONCEPTUAL FRAMEWORK

3.1 The concept of ICT integration

In Education, several studies have approached the phenomenon of the ICT integration at schools to study the role of ICT tools in teaching and learning, and analyze the process of their integration into practice teachings [2-3-4].

Thus, the concept of ICT integration has been associated with various meanings, including that we found in [2] and for the continuous and regular use of ICT tools in the classroom by teachers than by students. Dias (quoted in [2]) suggests, in addition to regular use, the context that will encourage active learning and support teaching.

Moreover, some studies have dealt with the integration of ICT in terms of change induced by technological innovations. Thus, the integration of ICT was considered as the process of realizing the changing levels of ICT use in personal, professional and educational practice of teachers [5-2-3].

3.2 The concept of appropriation

When the appropriation concept is associated with ICT, it has a positive connotation in the literature, because it is generally desirable to try appropriating ICT to make of it the best possible use. However, if the positive appropriation connotation of ICT does not seem uncontroversial, a common definition of the concept is far from being achieved.

Some define it as the result of a process, for example, Proulx [7-8-9], who considers appropriation as the result of a sequential process, requiring as Breton and Proulx, meeting three social conditions: to appropriate for a technical object, the individual must actually demonstrate a minimum technical and cognitive mastery of this tool. This mastery will creatively incorporate its current practices. In addition, the appropriation must give rise to opportunities for diversion, reinventions and direct contributions from users in the design.

While other researchers consider the appropriation as the process itself, for example, De Vaujany considers appropriation as a long process that begins long before the use phase of the technical object and continues after for a long time "first routinization use." [10]. So he divided the appropriation process in three phases: "Pre-appropriation" which refers to the initial discussions on the evocation of a technical object, followed by the phase of "original appropriation" where multiple socio-political processes and psycho cognitive are active in the organization, with emergence possibility of a strained relationship, then mitigated by the introduction of new routines, and finally, the final phase of the process with final installation routines.

IV. METHODOLOGY

The theoretical framework has distinguished a number of stages in the integration of ICT from non-use to the exemplary and routine use [5-2-6]. Thus, it is possible to broadly categorize teachers' practices in relation to the levels of ICT integration. Here, the purpose of this study is to determine what level of integration are the Moroccan teachers with respect to innovative uses of ICT.

We opted for the qualitative analysis of ICT use in connection with the innovative practices of teachers to highlight information that shows how ICT is used by innovative teachers. The interview technique was used as a tool for data collection.

4.1 Search tool: the interview

We chose to use the interview, because it is a way for the researcher to obtain the information that appears elsewhere [11]. For Mayer and Ouellet [12] "We speak of semi-directive interview when the researcher uses an interview guide that allows to focus on some of the narrators about limited topics by the research object" (p.456). For this, we developed an interview guide for innovative teachers. The choice of the semi-directive interview seem the best suited to the exploration of respondents' reports with predefined themes in the interview guide.

4.2 Context and Sample constitution

Inspired by the work of Raby [2] on the ICT exemplary integration to primary school teachers, we selected a sample of teachers who received awards contest "Innovatice" to maintain their relationship with ICT, their path in the use of technology in the classroom, personal, social and professional factors which enabled them to succeed and to collect their views on how to integrate ICT in teaching.

The identification of innovative teachers was facilitated by our professional position and our network contacts within the Innovative Teachers Association and at the level of central service dealing with contest.

4.3 Brief overview of "Innovatice"

The project "Innovatice" is the Moroccan version of the program "Innovative Teachers" that Microsoft worldwide launched. As part of this program, it is organized every year and for each country "Innovative Teachers Forum" known in Morocco under the same name "Innovative Teachers Forum". In the context of educational reform and the emergency program, the Ministry of National Education and Microsoft organize the annual Innovative Teachers Forum. This is a national competition of innovative projects in the use of information and communication technology in education. This contest is open to all teachers who have realized pedagogical projects aimed at improving the quality of their teaching. It has as an objective to "Strengthen the capacity of human resources working in the education sector, particularly teachers, to encourage teachers to embrace a conducive attitude to innovation. Assist teachers with ICT skills to better prepare their students. "

The first forum was held in 2005 and since then a hundred teachers from elementary, middle and high schools participate yearly in the competition by submitting their ICT projects to a national committee that chooses the best. The table below shows the evolution of the participation level of 16 Regional Academies for Education and Training (RAET). The National Center of Educational Innovation and Experimentation (NCEIE) recorded that the winning projects for all disciplines concerns Arabic, Physics-Chemistry, Mathematics and French.

Table 1: Evolution of participation in the Innovative Teachers Forum

Year	Teachers	Academy
2005	227	14
2006	235	14
2007	159	16
2008	207	16
2009	197	16
2010	261	16

Source: NCEIE

On the six editions that account the forum to its credit, 71 teachers were awarded. According to NCEIE sources, the number of participants is a little higher among primary school teachers and the participation of female teachers is far below than that of male teachers. Winners share on all RAET and the event history clearly shows that some RAET are more present than others and their share award is higher.

4.4 Constitution Sample

We used the randomly probabilistic sampling technique since we have the list of the award-winning teachers. "The use of this sampling probabilistic technique cannot be done if the researcher has a list of all the units of the parent population and each unit is numbered." [13], (p: 217). Thus, using this technique, we ended up with the following sample:

Table 2: Sample Characteristics

Teachers	RAET	Cycle	Discipline	Award year
E1	L'oriental-Oujda	Secondary school	Technology	2006
E2		Secondary school	Music Education	2010
E3	Sous-Massa- Draa	Primary school	Amazigh	2009
E4		Primary school	French	2010
E5	Meknes-Tafilalt	High school	Physics	2005
E6	Chaouia-	High school	History and Geography	2008
E7	Grand Casablanca	Primary school	Mathematics	2009

The individual interviews were conducted depending on the participants' availability that we contacted in advance regarding the appointment, sending the interview guide and agree with the communication tool to use during the interview. On our proposal, the teachers agreed that we use the tool of the audio conference «SKYPE" allowing to converse by text and phone. The duration of each interview was 30 min.

The interview guide questions the variables of our research related to the ratio of innovative teachers to ICT, their careers in ICT, personal experience, professional and pedagogical use of ICT in life, at school and especially in the classroom and their perception of ICT role in the teaching and necessary conditions for their integration in pedagogical practice

4.5 Methodology Limits

The study we conducted took place with teachers that are interested in ICT issues. Among these earned teachers due to the use of ICT in the classroom, we went to see teachers who are recognized by the Ministry as good example user of ICT. Thus, the selected population is characterized by its willingness to integrate ICT into their practice; commitment and involvement of teachers facilitated the work of the researcher, and prevents the investigation to be biased by contextual considerations.

Another weakness relative to the data collection is related to the credibility of the provided information by respondents; some may just answer to satisfy us. Note, however, that a sample of seven innovative teachers only for interviews from a larger population implies limitations to the result generalization.

Lexica has facilitated the work of selection, coding, annotations, grouping and comparing data. Some functionalities have been of a great help in individual analyzes and comparisons of this research.

Thus, in the light of the literature requirements, the process of content analysis first focused on the transcripts of interviews Verbatim data [14-15] and reading the Verbatim several times, attention has been paid to this point especially on the clear and explicit aspect of content of the interviews in terms of our framework [16].

V. RESULTS

5.1 Participant profiles

The innovative teachers being accepted to participate in the survey are seven, two women and five men, their average age is 35, the youngest is 28 years old and the older is 56. They are experienced (at least 6 years teaching) and represent the three levels of education (3 of elementary, 2 of secondary school and 2 of high school). All participants have a university degree and have completed initial training preparing for the teaching profession and continuous training on the pedagogical use of ICT. All were awarded for their production of digital resources (application, tutorial, scenario ICT).

5.2 ICT Integration Context

Professional context

7 Innovative teachers practice in urban schools in which the average class size is 34 students. Students have the opportunity to exploit the hardware (fixed SMM, mobile MMS and IWB) at least once a week. The majority of participants have the administrative and pedagogical support to develop the use of ICT in teaching and to share expertise techno-pedagogical between teachers.

Technological Context

All innovative teachers have their own laptops and Internet connection at home. Schools where they work are also equipped with fixed multimedia classrooms (7 schools), IWB (4 schools) and mobile multimedia classrooms (2 schools). All classrooms are connected to the Internet. So, the 7 Innovative Teachers operate in a personal and professional environment marked by the presence of technologies they can use in their work either inside or outside school and thus have more time access to ICT.

5.3 Place of ICT in teachers practices

5.3.1 Personal practices of ICT

It is understood by the ICT personal practices, all activities that the teacher leads outside school, on personal time using ICTs to realize those activities. Thus, it is possible to quote homework when the teacher uses ICT to communicate with others, seeks information and produces personal documents (home financial management, pays bills online, shopping on commercial sites ...).

The seven participants felt that personal use of ICT is an inescapable reality dictated by the demands of today's society. They believe that ICTs are now a part of the social landscape of individuals and communities.

Invested time

Encountered innovative teachers affect an average of two hours per day for personal use of ICT. Without exception, the seven participants reported regular use of ICT outside the school. Encouraged in this by the spread of Wi-Fi in cafes in most urban areas. Thus, teachers have the opportunity to use ICT in public areas (cafes, libraries...) are more likely to provide access points to the network. At home, the operating time is proportional to the number of activities and their nature. In addition to personal activities listed above, the teacher is sometimes forced to use ICT to review with his children, help them to provide evidence or support in the effective use of research tools, treatment or storage.

It is obvious that the invested time in the personal use of ICT is growing under the leadership of social environments that give to the citizen the means of access to ICT, in addition to the fact that the teachers' houses are increasingly equipped with computer and internet.

Levels of ICT personal practices

The data analysis revealed that the interviewed teachers justify a long experience in personal use of ICT (minimum 6 years). 4 teachers have begun to use innovative ICT before they integrate professional life. For two of them, the interest in ICT began at the university. The other two teachers state that the first contact with ICT has been in a personal use.

The analysis showed that the motivations behind ICT personal practices of 4 teachers are different. Thus, if the curiosity motivated one of them, the second was motivated by the discovery need. So the need for development has motive the two other teachers.

Considering of the experience of teachers in ICT, they all have gone through all stages of ICT integration process. The regular use of ICT in personal practices of the seven teachers put them in the stage of appropriation-routinization [5]. Indeed, this use shows that these teachers have the technical mastery and frequent use in daily life.

5.3.2 ICT Professional Practices

It is good to recall that the ICT professional practices refers to the use of ICT tools in information and communication activities, documentary research, production and storage of documents for professional purposes.

It stands out the results of the data analysis that three teachers on seven had their first contact with ICT in a professional setting. The trigger point was the ICT training they attended.

Levels of ICT Professional Practice

Some teachers have gone directly to the stage of "motivation to stage of appropriation-routinization." Lack of familiarization stage in four teachers is explained by the fact that they all started to use ICT before they integrate teaching. Remaining three, with no personal experience of ICT, they began to take an interest in ICT in professional practice; their practices have evolved step by step to arrive at the current appropriation-routinization.

The seven teachers used ICT in different ways. All have used ICT to communicate with colleagues, administrators and with students, to plan courses to prepare pedagogical materials, to find information on professional topics and manage student assessment.

As the seven teachers were awarded in the national competition "Innovative", they believe that their consecration is recognition of MNE of their ICT use skills. Asked about their feelings after the competition results, the majority of them highlight aspects of personal development and improving self-image.

The award-winning productions of innovative teachers indicate a desire to improve teaching practices by exploiting the ICT potential. If the tools are diversified and contents differ from one teacher to the other, the goal remains common and shared: the adoption of the posture of reflexive teacher changing its personal practice to the light of changes observed and takes advantage of the technological context to bring more value to our professional services. This goal was realized through websites, pedagogical scenarios and simulation applications or interactive exercises. We will quote some examples below:

The first example is an educational site for Mathematics activities offering activities of support online and outside school hours. It also includes information for teachers and some practices for sharing.

Three other teachers have also developed websites; 2 sites for each disciplinary learning Amazigh and the other for arts education (music).

The third deals with pedagogical and technological content that might interest the teachers.

A female primary school teacher preferred to work on the production of a pedagogical scenario dealing with the

integration of ICT in the course of scientific openness.

And production of a different nature were realized, it was simulation of physical phenomena, or interactive exercises in electronics.

VI. CONCLUSION

Teachers who have better integrated ICT tools in their teaching practice are often teachers who have completed one or more training on the use of ICT. Motivated, and having a direct and permanent access to ICT (school, home ...) innovative teachers have become producers of quality digital resources. Thus, it is clear that the right technical level of teachers is the result of a process of ICT appropriation which has enabled them to run frequent and regular use of technology in personal and professional practices.

The results of the study have also shown that the levels of ICT integration in teaching practices vary depending on whether they are personal, professional and pedagogical. In other words, teachers use ICT more regularly especially in personal practices and have a great mastery of the software and related applications (digital photos, business transaction, personal blog ...).

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