

Teachers' attitudes and barriers to implementing ICT in education Case study: Public middle schools in Morocco

Mrs. Zaina EL Mouden, Phd Candidate

LARLANCO (Laboratory of Languages and Communication Research)

Faculty of Letters and Human Sciences

Ibn Zohr University, Agadir, 80000, Morocco

zainaelmouden@gmail.com

Corresponding Author phone number: 00212 662 854 742

Mr. Idriss EL Ouafa, PhD Supervisor

LARLANCO (Laboratory of Languages and Communication Research)

Faculty of Letters and Human Sciences

Ibn Zohr University, Agadir, 80000, Morocco

i.elouafa@uiz.ac.ma

Abstract

ICT implementation at schools is a great challenge to Moroccan educational authorities. To ensure a successful integration of technology tools in classrooms, several measures are undertaken during the reform phases to reinforce infrastructure, to supply schools with necessary equipment and digital resources, and to provide adequate ICT training for teachers. However, the great efforts and the huge budgets invested to achieve these goals are insufficient and often judged inappropriate to concretize this action plan; which has impacted the teachers' perceptions and attitudes towards this ambitious project. This paper constitutes the only study that has investigated the teachers' attitudes and the barriers that hinder the use of ICT in 28 public middle schools in Inezgane Ait Melloul delegation. The collected data through a mixed-method combining a questionnaire and a semi-structured interview reveals the teachers' willingness to contribute in this project though some of them have a relatively negative attitude due to many barriers. The study also suggests some recommendations formulated through data analysis and discussion.

Keywords: ICT integration, barriers, teachers' attitudes, education, reforms

1. Introduction

Improving education quality is a main concern for educational systems. As many countries boost their economic growth through sustainable policies and effective strategies, the field of education has also to go through the same evolution to keep pace with rapidly developing societies in terms of technology. Recently, technology tools are prevailing in our lives transforming societies into digital communities where individuals are linked by all means of communication devices offering easy and

free access to information which was decades ago attributed to schools. In fact, teachers used to be the only source of knowledge in the past adopting a classical teacher-centered approach. However, the era of internet has made information available to students thanks to ICT tools (Syed Noor ul Amin, 2016). This traditional model does not encourage students' interactions and initiatives. To this end, internet and technology has changed teaching and learning methods urging thus teachers to innovate and adapt their teaching to ICT implementation approaches.

In this perspective, many educational authorities in developing countries, including Morocco, have tried to integrate ICT in their schools. This new strategy has been implemented through many reforms of Moroccan educational system. The National Charter of Education has focused on ICT integration to promote education quality. In 2009, the Emergency Plan allocates huge budgets to accelerate and achieve goals set in the previous reform through a national program launched by the Ministry of Education. The GENIE program (**GEN**éralisation des Technologies d'**IN**formation et de Communication dans l'**EN**seignement) aimed at supplying equipment and necessary ICT material at schools, providing adequate ICT training for teachers and developing digital content curriculum. Nevertheless, despite considerable efforts and huge investments, ICT integration in Moroccan schools is still at its infancy due to many barriers that hinder the successful implementation of ICT. This context has created the need to conduct a survey to investigate in depth teachers' attitudes and barriers that might prevent the achievement of the goals set by the Ministry of Education.

2. Problem statement and study significance

Moroccan National Charter for Education priority is to equip middle schools of necessary material including video projectors, computers, data shows and digital multimedia material in order to accelerate ICT implementation. This procedure requires significant funds and recurrent regional supervision and guidance. Moreover, integration ICT demands a great investment in terms of teacher training in ICT usage.

Nevertheless, although the ministry allocates large funds to this project, technology tools are rarely used by the teachers in Moroccan middle schools. In this paper, the main research question explores the barriers that hinder teachers from implementing ICT in their teaching practices and looks into their attitudes toward using education technology. In addition, this paper provides a baseline study aiming at monitoring and assessing ICT implementation in some middle schools. It also informs the Academy and the delegation as well as the educators of the main barriers that face the teachers and impact their attitude towards the use of ICT.

Moreover, this paper sheds light on the way technology tools are really used by Inzegane Ait Melloul delegation teachers. Generally, this study aims at assisting educators, delegation staff, teachers, inspectors and administrators to reconsider and review their strategies in implementing ICT.

3. The scope of study

This study was conducted in the 28 middle public schools in Inezgane Ait Melloul delegation which is among the 7 delegations in Agadir Idaoutanane Academy of Education in Morocco. The study focuses on the analysis of the barriers hindering ICT implementation in public middle schools in the

delegation and teachers' attitudes toward technology integration. The study also suggests some recommendations formulated through data collection including questionnaire analysis and some interviews.

4. Study question

This paper combines quantitative and qualitative methods to look into this study question:

What are Moroccan teachers' attitudes towards ICT integration and what barriers do they claim prevent this implementation?

This question leads to two sub-questions:

- How do the teachers of different subjects perceive ICT integration in Moroccan middle schools?
- What barriers teachers claim to hinder them from the use of ICT?

5. Literature review

Implementing ICT in classroom context can offer rich opportunities for students as well as for teachers in the teaching and learning process. In fact, the use of ICT helps students to improve their learning abilities and allows the teachers to innovate in teaching practices (Wong et al 2006) as it also helps teachers to identify and target students' specific needs (Romeo, 2006; Shamatha Peressini and Meymaris 2004). Several studies underline the positive effects of ICT implementation on teaching and learning (Peeraer & Petergem 2011, Keengwe & Onchwari 2011, Higgins & Moseley 2011). Technology tools allow students to learn by doing, to engage in real time conversation, to enhance students' motivation, engagement and achievement, develop collaborative learning abilities and acquire problem-solving skills (Ehrmann 1994, Keengwe & Onchwari 2011). Despite this great potential, ICT tools are not effectively integrated since some teachers have different beliefs and attitudes.

5.1. Teachers' attitudes towards the use of ICT

Research shows that many teachers have generally a positive attitude towards implementing ICT at schools (Albirini 2006; Jimoyiannis, A., & Komis, V. 2006). Meanwhile, other teachers who do not have required skills to integrate technology in their teaching practices because of being computer illiterate and lacking confidence in the use of ICT can express negative attitudes towards ICT implementation (Jimoyiannis, A., & Komis, V. 2006). Moreover, the researchers believe that female teachers have high levels of computer anxiety and lack confidence in using computers (Rosen and Weil, 1995; Lee, 1997). In addition to gender, grade levels can also determine teachers' attitudes. Primary school teachers are more reluctant to use computers at school while others avoid completely using them in high schools. On the other hand, middle school teachers are more likely to integrate technology tools in their classrooms (Jimoyiannis, A., & Komis, V. 2006; Shapka and Ferrari 2003).

An exploratory study conducted by Jimoyiannis, A., & Komis, V. (2006) in middle schools showed that 25% of the participants use ICT for lesson preparation only. However, those teachers still believe in the ICT great potential in the teaching and learning process. Yet, the lack of ICT training

in front of computer skilled students constitutes another reason for adopting negative attitudes towards implementing ICT.

5.2. Barriers to implementing ICT at schools

Implementing ICT in education faces many difficulties. Literature review dealing with these barriers use different classifications. Some researches classify barriers into extrinsic and intrinsic barriers. Extrinsic barriers refer to access to material, time, training, resources and technical support whereas intrinsic ones are linked to attitudes, practices, beliefs and resistance to change and innovation (Ertmer, 1999). On the other hand, other researches deal with barriers at two levels: teacher-level barriers and school-level barriers. Moreover, according to BECTA report (2004) the same levels are reconsidered consecutively as barriers related to the individual including lack of confidence in using ICT, length of curriculum content, lack of time, and resistance to innovation and change. In the same perspective, barriers related to the institution such as insufficient and unavailability of resources, lack of technical support and lack of appropriate ICT training. A third level, added by Balanskat et al (2006), is related to the educational system barriers such the approaches to ICT implementation, educational guidelines and framework.

6. Method

6.1. The target population

This study, as mentioned above, was conducted in the 28 middle public schools in Inezgane Ait Melloul delegation in 2015. The target population is constituted of teachers of different subjects in these schools as illustrated in figure 1. The total number of teachers is 1040. A random sampling was used to distribute six hundred questionnaires in the 28 schools. The response rate was up to 52%. Three hundred fifteen were completely filled and returned. The remaining copies were discarded as they were incomplete.

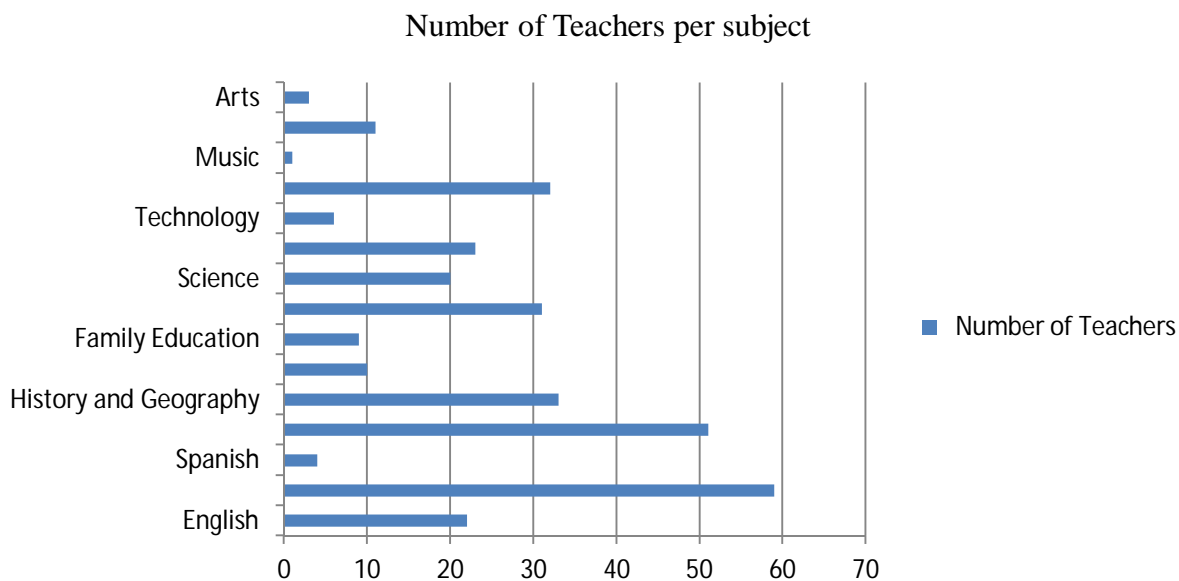


Figure 1: Number of teachers per subject

The study includes teachers from all subjects taught in middle public schools to provide a global insight about the teachers' attitudes bearing in mind that every school subject has its own characteristics and to make data available for educators and administrators of the delegation.

6.2. Instruments

The main instrument used to gather data in this study is a questionnaire supported by a semi-structured interview of six middle school principals. The questionnaire includes four parts.

- Part 1 deals with the respondents' demographic information: gender, age, the taught discipline, grade-level, teaching experience
- Part 2 deals with school infrastructure, ICT equipment and digital resources availability
- Part 3 is related to ICT skills and teacher competence in using technology tools
- Part 4 includes teachers' professional development and ICT training

7. Results and discussion

7.1. Teachers' attitudes and perceptions towards ICT implementation

The sample of the study is constituted of 149 female teachers and 166 male teachers and their age groups are demonstrated in the table below.

Age	Participants
20 - 25 years	3
26 - 35 years	82
36 - 45 years	116
46 - 50 years	61
Over 50 years	53
Total	315

Table1: The participants' age groups

The participants' age is very significant in the analysis of the teachers' attitudes. The age also indicates the respondents teaching experience. Both age and teaching experience have impacts on the teachers' attitudes towards ICT (Jimoyiannis and Komis, 2001). In this study, the collected data including questionnaire analysis and data from the semi-structured interviews reveal generally a positive attitude of the participants (60%) who agree that ICT integration could improve the teaching and learning process and enhance students' motivation and engagement (BECTA 2004). 198 teachers having 10 to 20 years of teaching experience regularly use ICT in their classrooms while 117 teachers rarely implement technology tools. The rare use of ICT is attributed to many obstacles related to infrastructure, equipment, ICT training and other barriers to be discussed later in this paper. As an illustration, 250 participants declare to have acquired and developed ICT skills thanks to their own personal initiatives and personal development, and more than 70% of the teachers use their own computers and their own projectors due to lack of material in their classrooms.

7.2. Barriers related to infrastructure and equipment

The Moroccan ministry of education emphasizes in the pillar 10 of the National Charter of Education the importance of the integration of information and communication technologies in education. In order to implement this reform strategy, the ministry has allocated huge budgets to provide schools with necessary equipment and infrastructure. However, according to one of the interviewed school principals, some schools lack equipped multimedia rooms and school computer laboratories. The level of equipment differs from one school to another. In this sense, teachers participating in this survey confirm that middle public schools in the same delegation do not have the same level of equipment. The results show that 34 teachers, (10,8%) consider that the level of infrastructure including electricity, multimedia room, school computer laboratory is good while 162 (51,4%) respondents report that infrastructure is very weak. Similarly, 52,1% report that the level of equipment in their schools is very weak and only 48% of the participants including History and Geography teachers (33%) , Science teachers (31%) and Physics teachers (20%) report having access to computers. These teachers have benefited from the national reform program's (GENIE) equipment including computers and data projectors. In the same perspective, 242 teachers (76.8%) report that equipment and digital resources are essential to their teaching practices. 271 teachers (86%) confirm that the computers available in their schools are obsolete. The same observation is raised by the Deputy Education Minister during this study. He confirms that many middle schools are equipped with high quality material which has not been unexploited for many years before scheduling adequate ICT training for teachers. Therefore, according to the interview with the Deputy Education Minister, almost all the 28 middle public schools lack technical support and maintenance, which has been shared by 226 (71.7%) teachers pointing out that equipment maintenance is rarely done in their schools.

Maintenance and technical support	N° of teachers
Regularly done	5
Done at the beginning of the school year	5
Done when needed	79
Rarely done	226

Table2: Maintenance and technical support reported by teachers

In this regard, the six interviewed school principals agree that the repair and maintenance procedure at the delegation is very slow as many requests for repairs are made at the same time. In order to overcome this barrier, they resort to external technicians for repair and equipment maintenance while some computer teachers volunteer to update and set up the new software. In this context, 293 teachers (93%) report the absence of an ICT resource person in their schools. Some ICT literate teachers assist some of their colleagues to better use ICT in their classrooms. Therefore, the need for adequate teacher training is urgent for a successful integration of ICT in their teaching practices.

7.3. Barriers related to teacher training and professional development

ICT implementation requires effective ICT training for teachers. Lack of training is widely referred to in literature (Albirini, 2006; Balanskat et al, 2006). According to the interview with professional

development department committee, the main objective of the training is computer literacy and teachers' awareness of self-training. Inspectors are also involved in the training programs and are invited to facilitate and provide training on the integration of ICT. During training classes, teachers share and exchange projects integrating ICT. Participants can also collaborate by learning from each other by subscribing to websites and blogs designed for classroom use of ICT. The committee also confirms that the training is not limited to a certain program but it is adapted to the teachers' needs. According to the same statements, digital literacy is an elementary module of initial training at pedagogical centers since 2011. Moreover, the oral exams include a computer skills grid. In this regard, 38 participants aged 26-25 in this study report having developed ICT skills at pedagogical centers. On the other hand, 55.6% of the respondents have not received any ICT training compared to 43.8% who confirm having received only one training course given by some inspectors of some disciplines. Furthermore, ICT professional development department sets up in collaboration with Microsoft training courses entitled MOS certification (Microsoft Office Specialist). The course aims at initiating teachers to the use of software (word, excel, PowerPoint) and is certified by Microsoft. In fact, the teachers are not satisfied with this short-term training because the groups of teachers are very heterogeneous. Some training groups consist of computer teachers and other teachers who do not have basic computer skills. The lack of segmentation has a negative impact on the content, on the progress and the quality of the provided training. In addition, the trainers themselves lack some computer skills. This constitutes another barrier revealed by some of the respondents in this study. It is clear that ICT training and professional development is a basic pillar to guarantee a successful integration of ICT in education.

8. Conclusion and recommendations

This study carried out in the 28 public middle schools in Inezgane Ait Melloul delegation reveals a concrete context of ICT implementation and is the only study so far conducted in these schools. It supplies rich data to education stakeholders in the delegation as well as in the whole Academy of Education. It sheds light on the teachers' attitudes and on the barriers that prevent effective ICT integration. In fact, throughout the enormous reforms that Moroccan educational system has gone through and despite huge budgets and considerable efforts to promote the quality of education, the educational policies still need firm and clear strategies to implement a new vision and set evaluation procedures to determine the strengths and the weaknesses of different undertaken actions. In addition to lack of long-term clearly stated educational policies, the ambiguity and often unclear objectives make the implementation of an innovation unsuccessful. The teachers, despite their positive attitude towards ICT integration, reveal important barriers that negatively impact the desired change in enhancing the teaching and learning quality. Through the instruments adopted to carry out this study, some recommendations can be formulated on the basis of the collected data.

Recommendations

- The Moroccan Ministry of Education should provide a long-term and a clear-objective stated policy for ICT implementation. Regional Academies of Education and local Delegations have to monitor and evaluate the process of the integration in collaboration with teachers and inspectors.
- Educational authorities have to share objectives and intentions with the teachers and take their feedback into consideration, and encourage teachers' collaboration within regular meetings and workshops.
- ICT Equipment has to be regularly renewed and the ministry's equipment strategy has to be reconsidered. It is ill-conceived to equip schools all at once ignoring the schools' particularities as the schools' needs differ from urban to rural areas in addition to the fact that ICT training for teachers was scheduled many years after equipping schools. As a consequence, some multimedia and computer rooms are not used and full of aging and useless ICT material.
- Availability and access to technical support and maintenance has to be a priority that goes hand in hand with equipment strategies that previously ignored this important component. From the collected data, some schools rely on the computer teacher to offer technical support to other teachers while in other schools the computer teacher is not available. So, the material becomes over years useless.
- ICT teacher training has to be regularly scheduled out of periods of national and regional exams to allow teachers cover the curriculum items specific to every subject. Also, professional development's objectives have to take into account the teachers' needs and the particularities of every school subject. Thus, an effective segmentation is required to avoid random teacher selection.
- Curriculum and text books have to be reconsidered and adapted to the use of ICT. Teachers often report that content length and textbooks adopt traditional approaches that do not let room for innovation and implementation of new teaching techniques that facilitate ICT integration.
- Teaching approaches, assessment and evaluation methods and students' leaning strategies have to be reviewed to meet the requirements of ICT use. Teachers who integrate successfully ICT in their teaching practices report that they innovate and try new methods in their classrooms. However, assessment and evaluation methods are still done in a traditional way, which makes students lose motivation and interest during assessment tasks. It is clear that the main objective of ICT integration is to enhance and promote learning. Yet, since assessment is a crucial phase in the learning process, educational authorities have to include as a main objective to assess students through ICT. Thus, research has to be conducted in this area of study to draw teachers', educators' and inspectors' attention to innovate and elaborate new assessment and evaluation methods.

References

- Abdeljalil Akkari, (2004). Education in the Middle East and North Africa: The Current Situation and Future Challenges, available: <https://eric.ed.gov/?id=EJ903844> (July 23, 2019)
- Albirini, A. (2006). Teachers' attitudes toward information and communication technologies: The case of Syrian EFL teachers. *Computers & Education*, 47(4), 373–398.
- Arthur Tatnall, Omponye Coach Kereteletswe, Adrie Visscher, (2010). International Technology and Managing Quality Education: 9th Conference IFIP WG 3.7 Conference on Information Technology in Educational Management
- Balanskat, A., Blamire, R., & Kefala, S. (2006). *A review of studies of ICT impact on schools in Europe*: European Schoolnet.
- British Educational Communications and Technology Agency. (2004). A review of the research literature on barriers to the uptake of ICT by teachers. Available : http://dera.ioe.ac.uk/1603/1/becta_2004_barrierstouptake_litrev.pdf
- Bingimlas, K. A., (2009). Barriers to the successful integration of ICT in teaching and learning Environments: a review of the literature. *EURASIA Journal of Mathematics, science and technology Education*, vol. 5, no. 3, p. 235-245
available : <www.ejmste.com> (July 22, 2019)
- Chandan Singavi and Prema Basargekar, (2014). Barriers perceived by teachers for use of Information and Communication Technology (ICT) in the classroom in Maharashtra, India, available : <https://files.eric.ed.gov/fulltext/EJ1220774.pdf> (July 23, 2019)
- Drissia Chouit, (2017). Exploring the correlation between professors' use of ICT in teaching and the level of institutional support, available <http://www.jeltl.org/index.php/jeltl/article/view/39/pdf> (July 24, 2019)
- Ertmer, P. A., (1999). Addressing first- and second-order barriers to change: strategies for technology integration. *Educational Technology Research and Development*, vol. 47, no. 4, p. 47-61
- Hicham Ziyad, (2016). Integrating Computers in the Classroom: Barriers and Teachers' Attitudes, available <https://pdfs.semanticscholar.org/> (July 24, 2019)
- Higgins, S. & Moseley, D. (2001). Teachers' Thinking about Information and Communication Technology and Learning: Beliefs and Outcomes. *Teacher Development*, 5(2), 191-210. Available, <https://www.learntechlib.org/p/94354/>.(July 24, 2019)
- Jimoyiannis, A. and Komis, V. (2001). Computer simulations in physics teaching and learning: a case study on students' understanding of trajectory motion, *Computers & Education*, 36, 183-204
- Jimoyiannis, A., & Komis, V. (2006). Exploring secondary education teachers' attitudes and beliefs towards ICT in education. *THEMES in Education*, 7(2), 181-204.
- Jimoyiannis, A. (2008). Factors determining teachers' beliefs and perceptions of ICT in education. In A. Cartelli, & M. Palma, *Encyclopaedia of information communication technology* (Vol. 1, pp. 321-334). New York: Information Science Reference.

- Keengwe, J. & Onchwari, G. (2011). Computer Technology integration and student learning: Barriers and promise, *Journal of Science Education and Technology* 17(2011) 560-570 <http://dx.doi.org/10.1007/s10956-008-9123-5>
- Lee, K. (1997). Impediments to good computing practice: some gender issues, *Computers & Education*, 28, 251-259
- Peeraer, J, & Petergem, P. (2011). ICT in teacher education in an emerging developing country: Vietnam's baseline situation at the start of the year of ICT. *Journal of Computers & Education* 56, 974-982 <http://dx.doi.org/10.1016/j.compedu.2010.11.015>
- Rosen, L. and Weil, M. M. (1995). Computer availability, computer experience, and technophobia among public school teachers, *Computers in Human Behavior*, 11, 9-31
- Shapka, J. D. and Ferrari, M. (2003). Computer-related attitudes and actions of teacher candidates, *Computers in Human Behavior*, 19, 319-334
- Syed Noor ul Amin, (2016). ICT integration in education (A smart Concept of Teaching & Learning) Educreation Publishing, available <https://files.eric.ed.gov/fulltext/EJ1086973.pdf> (July 24, 2019)