

TEACHING MATHEMATICS WITH NEW TECHNOLOGIES, SOME PERCEPTIONS OF EFFECTIVENESS OF ICT US IN MOROCCO

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Abstract

Many countries are realizing the importance of equipping their educational institutions to the new technology of connection, information and communication. Connectivity provides many benefits, including access to an ever-growing volume of educational information, opportunities for collaboration and the use of online applications. In addition, it is important for students, as well as teachers, to learn information and communication technology (ICT) skills to enable them to participate in the evolving knowledge society. The Moroccan government is heavily investing in human and physical capital and has undertaken important regulatory reforms in order to introduce this tool in teaching. This paper highlights the efforts in this regard and describes some aspects of teaching mathematics using ICT, benefits and constraints and stakeholders who can promote the integration of this tool in the process of teaching and learning.

Keywords: Teaching mathematics, ICT, education, Morocco

Introduction

The development of the countries cannot be achieved without effective knowledge of science and mathematics. In recent years, new technology every day investing in the cultural and social aspects of our life: they are such a great vector of communication for business and a fundamental tool for research. It is for this reason that the education systems of countries that are concerned about their development put great importance on the study of mathematics. But the manner in which mathematics has been taught has caused many reticences among both students and teachers. The mathematics makes bad memory to the most of generations which studied with the rule, the compass and strenuous and repeated exercises. Actually, children require to see mathematics as tool of emergence and intelligence and not to reduce them under famous and classic words: true or false! The rapid development of information and communication technologies (ITC) requires their integration into the process of teaching and education (La Velle & Nichol, 2000; Lever-Duffy, McDonald, & Mizell, 2003). ICT has been found to be a very important step in education around the world. It can be used in the classrooms to make learning more fun and interesting and therefore more effective. There is potential with today's technologies to train teachers in high quality teaching skills even when they are in extreme rural conditions, unable to attend training sessions. Technologies can reach people that could not be reached before, and everyone in the education system benefits.

However, the effective integration of ICT into education and specially teaching mathematics resists against the integration of these new technologies (Askar & Usuel, 2002; Kilicman & al; 2010). The reasons for this resistance are many: lack of knowledge or

skills in the use of these new technologies, difficulty to accept new working methods and sometimes even asserting the ineffectiveness of these technologies.

In addition, The ICT in education is subject to a number of recommendations for use by Moroccan Ministry of Education, a large amount of notes and articles they are dedicated. But what about the reality of their integration into normal educational practices, the brakes, levers and the actual distance between these tools, the teacher and the students who use them? It is in this global perspective that will fit any changes in teaching practices, and this state is reflected in a general way by the fear of change.

ICT programs in Morocco

Despite its recent integration, ICT have had a significant impact on schools, on teaching and on learning. In point of fact, schools have similar needs to any small business and use the same kinds of computer software for such tasks as accounting, student absence control, communicating, document preparation and printing. Schools also use specialist software for tasks like timetabling, electronic reporting, behavior tracking and student profiling, monitoring attendance and library management. In a whole number of ways, then, ICT tools are proving indispensable in making school administration more efficient and responsive to community needs.

Facing the digital challenge, the Moroccan government is working to prepare a platform, leading a new policy with strategic goals for executing an intergovernmental network, support economy based on knowledge and innovation in Morocco, the development of human resources and infrastructure for use of Information and Communication Technology (United Nations, 2004).

This technological revolution in education certainly influences learning styles. This is one of the topics that formed the basis of the national strategy for the development of Information and Communication Technologies (ICT), in order to record improvements. In fact, in the recent years, the Ministry of National Education and Training, embarked on an ambitious program to the generalization of ICT into the education system. Which program is focused on three main objectives namely: infrastructure, training, and the development of content (GENIE Program MEN, 2006).

The first phase of the generalization of ICT (January, 2009) equipment has 1 878 establishments with 2 058 Multimedia rooms which are functional only in 1543. As for teacher training, this first phase has enabled 30 000 people to benefit. Also, following the evaluation of the first phase of deployment of GENIE strategy, a fourth axis linked to the development of practice has been built to facilitate and accelerate the improvement of the quality of learning and teacher professional development, which will have some impact on the development of students' skills. The management of GENIE is placed on a steering committee chaired by the prime minister. A project team was created to follow the implementation of GENIE program. So, there are no major constraints facing Morocco, but the government is seeking innovative solutions and private-public partnerships to put in place the future pilot projects in the different priority themes. The government has to combine the efforts of all development shareholders to promote the active use of knowledge for development and to take advantage of ICTs to facilitate information sharing, communication, new applications of technology, and to foster democracy and moralization of public life using ICT as the major tool.

Place of computers in mathematics education

The computer system provides access to information and also analyzes this information, but the computer can facilitate access to knowledge as a part of a learning

process. The integration of this tool in the teaching - learning of mathematics transforms fundamentally mathematical activity.

Through a process of problem solving, modeling situations progressive learning demonstration, students can become aware of the relevance of mathematics activities, identify a problem and experimenting with examples, conjecture a result set form solution, monitor results and evaluate their applicability to the problem studied. The software tool thus proves an indispensable means to implement a real mathematical activity. It is important that the student knows distinguish between outcome within an experiment and a result established deductively in mathematics.

Indeed, it enables:

- Obtain a quick representation of a problem, a concept to make sense of it and to foster ownership by the student;
- To link different frameworks (algebraic, geometric ...) of the same concept or the same situation;
- To explore situations showing different configurations in dynamic manner;
- To speculate from interactive experimentation in studying a problem with open-ended questions or a certain complexity and conduct a verification;
- To work on solving problems from common situations,, if the calculations are long and complex;
- To expedite the verification of certain results.

Contribution of computers in teaching and learning

The computer provides access to different methods, techniques, numerical computation, graphics representations, acquisition and processing of experimental data and the set of methods for production of documents. It is a tool for documentary research (online and offline resources, encyclopedias, CD-ROMs and cultural services, etc.); Self-learning (with screening assessment, response analysis, control corresponding to a real training analysis) and self-assessment: production of documents, e-mail exchanges, production of websites. It allows classes in a profound transformation of the pedagogical relationship (educational contract) teacher-student. For example, the projection of a document for the whole class makes possible a collective effort through appropriate software (word processing, spreadsheet, etc...) and can mediate the dual teacher-student relationship.

On another, and according to the author (Abouhanifa and al. 2008), should not believe that the use of ICT is the radical solution to various problems related to the teaching and learning of mathematics in secondary, such as no motivation of students, school failure, scholar abandonment decrease level of proficiency in mathematics, etc.. However, these tools can be a catalyst leading to the teacher gradually innovates in methods and approaches while adapting to student activities.

With the prospect of a better visibility of this type of work, we must study the testimonies of class, in order to get the issues underlying the effective integration of computers in the classroom. Therefore, to give some answers to questions like: How mathematics teachers can they take to help students succeed and to acquire new knowledge, skills, attitudes and knowledge to act? How to reflect the interests and personality of each? How to set up learning, specific and unique to each learner?

The use of computers in the teaching of mathematics is therefore falls within the scope of innovative practices (multidisciplinary, team work, cross repositories and content ...). It is an educational approach that gives teachers the opportunity to invest in multidisciplinary teams, is a source of mutual enrichment.

Conclusion

A majority of teachers are convinced of the important role played by the use of computers in the teaching of mathematics in the classroom, as it offers some interesting exploration opportunities in a variety of situations for the teacher, and students by bringing to think about what he does (real work). However, a number of barriers hinder the effective integration of computers in the classroom. Mention may be made in this regard: the degree of control of computers, computer hardware maintenance, control of appropriate software and factors related to the management of time and content. The sources of these difficulties from the lack of teacher training in this area, the lack of computers for students or no number for teachers, lack of time (timetables charged, the risk of incomplete programs, ..), lack of interest and willingness on the part of teachers. Pedagogical and technical support, availability of resources and teacher training are the major difficulty.

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