INTEGRATION OF ICT IN TEACHING MATHEMATCS

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Abstract:

In the context of integration of information technology and communication in the Teaching / Learning of Mathematics, we propose a constructivist model of ICT integration in the context of mathematics learning, it aims to ensure acquisition of key concepts in mathematics to students in Moroccan middle school and improve their learning motivation, however this research target the group of learners with difficulties, lack of self-confidence due to multiple factors. How then fill in the gaps for these students? How to motivate them, give them confidence and trust in their same?

In this research we focus on mathematics in collecting, analyzing and detecting where / why / when problems arise in the majority of students, and provide remediation methods, these methods are in first degree ICT used in the mathematics education.

Key Words: Learner profile, Obstacles, ICT, Teacher Training, Learning

Introduction:

By focusing on the intentions of the teacher in his attempts to integrate information technology and communication in the teaching and learning of mathematics in Moroccan middle school , As highlighted by several researchers conduct their research on new technologies. Programs in Morocco show a strong commitment to the integration of new technologies in education[1]. Knowing that this integration is not easy and requires research in teaching, our research has the objective to provide elements for the integration of these new technologies in the teaching of mathematics, then how ICT use within the education system can change the nature of learning? Is their use does not alter the concepts and methods? What is their impact on students and teachers? (Lagrange et al, 2001)

We undertake research aimed at analyzing the obstacles that may hinder the effective use of this tool, the new dimensions of integration in the classroom, and the difficulties requiring the intervention of ICT.

Main Text:

The study is done on the high school college especially because it presents the period preceding the decision of students about their future course student, to prepare the prosecution of scientific or less scientific way in which mathematics is important and even essential.

we cannot deny that mathematics is deemed to be a difficult subject, they are preceded by a reputation and negative prejudices making this discipline repulsive, it is theoretically necessary to provide logical reasoning and simple restitution of knowledge, making it as a particular subject compared to other subjects where one can get good results just by learning its course.

Many people say they just do not like mathematics, often without bothering to explain their aversion. However, we can observe nature of adjectives frequently joined to this subject : mathematics would among other things, dry, cold, austere ... Even the philosopher and mathematician *Bertrand Russell* attributed thet two last adjectives in a sentence often quoted: "***The mathematics possesses not only truth, but supreme beauty, a beauty cold and austere, like that of a sculpture*** *...* [2] "

[1]. GENIE program: Generalization of Information Technologies and Communication in Education in Morocco)

Students who have chosen their path based on prejudice or false convictions are many students with low motivation and poor results *[Figure .1],* the research target category of learners have difficulty of imagining and having a lack of confidence due to multiple factors, such as being talented but having trouble concentrating or factors due to the transmission of knowledge (teaching error) depending to training teachers.

Various factors influence the teaching and learning of mathematics. The results of international surveys[3] indicate that the learning outcomes are related to student's family background factor and adolescence, especially the secondary collegiate studies coincide with adolescence *[Figure .2],* but also the quality of education, as well as certain characteristics of the structure and organization of education systems.

A good mathematical education of teachers requires special mathematical knowledge, specific presentations of mathematics they will teach and also conditions knowledge   of teaching these lessons. Fight against failure *[Figure.1]* Enhance the learning of mathematics at ther leaders of tomorrow is the major objective of this research especially the preeminence of science in Morocco is threatened for various reasons, including poor achievement in science education by students secondary *[figure.7],* Using different methods (classroom observations, interviews...), we look at how new balances manage to install. Understood that mathematics are the basis of all professions so reducing the number of low achievers in mathematics leads to an increase in the number of graduates in mathematics disciplines nature, especially the branch of science that holds the largest share of distribution of students per branch *[Figure.3].* the mathematical form young minds to intellectual rigor, logical reasoning, the argument as to understand numerical data, ie the process, interpret, present, mastering basic geometric figures. Mathematical difficulties are many and varied especially in geometry such courses requiring more concentration and imagination to a particular ability in space to demonstrate a solution sought.

Difficulties linked to representation, inability to correctly represent objects in space or in time, treatment of curves encountered in analysis. However, like any learning, these difficulties can be overcome**.**

Skills necessary for the practice of mathematics are not necessarily related to innate and can be acquired with practice and habit and then we suggest as a means: "**The information technology and communication in the mathematics** ", view that the contribution of ICT is essential today, computers and smart objects are in the process of changing our daily habits, our ways of working, our relationships and leisure

citizen faces figures, geometric graphs is mostly through software and often on a screen. It is essential that young people (for whom the use of a keyboard and a screen consultation are natural) receive a mathematical integrating these tools.

Thereby ICT can ensure the acquisition of key concepts in mathematics among students in secondary college and improve their learning motivation and of course contribute to the success of students deciding their future with total certainty to scientific expertise, the use of multimedia offers teachers the possibility of dynamic images played by the simulation of theoretical concepts difficult to grasp otherwise (Perreault, 2000a) using dynamic geometry software for example.

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[2].Russell, Mysticism and Logic and Other Essays, Londres, Longmans, Green, 1918,chap. 4 (« The Study of Mathematics »)

[3].https://www.google.com/url?sa=f&rct=j&url=http://eacea.ec.europa.eu/education/eurydice/documents/themat
ic_reports/132FR.pdf&q=&esrc=s&ei=XEFUUYPOJqO80QXdwYG4BA&usg=AFQjCNGK77aq5UmI-
juMhdVjNQLCfFEMtQ

[Figure .1]: Evolution of global data on the secondary college in Morocco

[*Figure .2]:*Distribution students by college ageof public school

The key actually is not calculating "laid", though there is an "episode" in the series of essential learnings in the area of computing (for training). The key is to master mental arithmetic and rational use of a calculator with control procedures. If the calculation itself is done (and done well) by a machine, the task of man is in control of her work smart. This requires the construction of other skills that traditional skills which allows students to take a proactive role because it is a decision maker in the process of knowledge construction, although it is accompanied by the teacher, this idea leads us to the definition of the **constructivist model** which has the advantage of breaking with the traditional approach to teaching.

This model gives priority to the development of didactic sequences that promote the establishment of a new relationship to knowledge among learners, and in which knowledge is constructed by students then interviewed the entire ICT and use of constructivist can guarantee satisfactory results in order to have a more effective learning of mathematics.

some definitions of constructivism:

- The constructivistic approach to teaching and learning is based on a combination of a subset of research within cognitive psychology and a subset of research within social psychology [4], http://chiron. valdosta.edu/whuitt/col/cogsys/construct.html
- Constructivism is an approach to teaching based on research about how people learn. Many researchers say that each individual constructs knowledge rather than receiving it from others.
- constructive teaching is based on the belief that students learn best when they gain knowledge through exploration and active learning.
- Education is centered on themes and concepts and the connections between them, rather than isolated information.
- Constructivism is a theory of learning based on the idea that knowledge is constructed by the knower based on mental activity. Learners are considered to be active organisms seeking meaning. Constructions of meaning may initially bear little relationship to reality (as in the naive theories of children), but will become increasing more complex, differentiated and realistic as time goes[5].

There are several guiding principles of constructivism:

- Learning is a search for meaning. Therefore, learning must start with the issues around which students are actively trying to construct meaning.
- Meaning requires understanding wholes as well as parts. And parts must be understood in the context of wholes. Therefore, the learning process focuses on primary concepts, not isolated facts.
- Since education is inherently interdisciplinary, the only valuable way to measure learning is to make the assessment part of the learning process, ensuring it provides students with information on the quality of their learning.

Conclusion:

The use of computers in mathematics education falls within the scope of practice innovantes.It is an educational approach that gives the teacher the opportunity to invest in multidisciplinary teams, therefore a source of mutual enrichment.

A majority of teachers are convinced of the important role played by the use of the tool in the classroom, however, a number of barriers hinder the effective integration of computers in the classroom. Can be mentioned in this context: the degree of control of the computer, computer hardware maintenance, control of appropriate software and factors related to the management of time and content. The sources of these difficulties arising lack of teacher training in this area, insufficient computers for students ...

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[Figure.1]: Evolution of global data on the secondary college in Morocco

[Figure.3]: Distribution of students by branches

[*Figure.7*]:of repeaters per level (public) secondary qualifying

Effective integration of computers in the classroom, thus requires a radical change in design of all actors, even the teaching that the level of contents of the form of activities. The new role of the teacher in the called teaching situation requires new skills that teachers must acquire. It requires a significant personal engagement on his part and that traditional environment. Personal work of any teacher can be facilitated by the collaboration and exchange experiences with colleagues from the teaching team.

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[4]. http://chiron.valdosta.edu/whuitt/col/cogsys/construct.html

[5].http://www.usask.ca/education/coursework/802papers/Skaalid/definition.html

Figures:

			2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11
Etablissements المؤسسات	Collèges إعداديات		-	-	-	414	515	640	696	747
الحجرات	Total مجموع		1 497	1 794	2 131	3 240	3 800	3 867	4 361	5 064
Salles	Dt nouv. Créat. منها		-	-	-	-	-	-	66	89
Classes الأقسام	Total مجموع		895	1 151	1 470	2 000	2 552	2 738	3 258	3 888
المسجلون الجدد	Total مجموع		8 603	11 207	15 498	20 873	21 373	25 760	30 252	34 050
Nouveaux inscrits	Filles إناث									
التلاميذ	Total مجموع		27 167	33 611	42 401	55 571	59 202	74 789	85 251	96 475
Elèves	Filles إناث									
تلاميذ السنة الثالثة	Total مجموع		8 537	10 174	13 008	16 580	17 778	23 945	27 262	30 333
Elèves 3ème année	Filles إناث									
مهنة التدريس	Total مجموع		3 454	4 211	5 108	-	-	11 804	15 438	16 822
Enseignants	Femmes إناث		1 135	1 385	1 688	-	-	3 566	5 114	5 536
مهنة الإدارة	Total مجموع		434	542	681	-	-	-	-	3 870
Personnel administratif	Femmes إناث		204	269	333	-	-	-	-	2 232
مهنة الخدمات	Total مجموع		360	497	560	-	-	-	-	6 946
Personnel de service	Femmes إناث		159	201	267	-	-	-	-	3 558

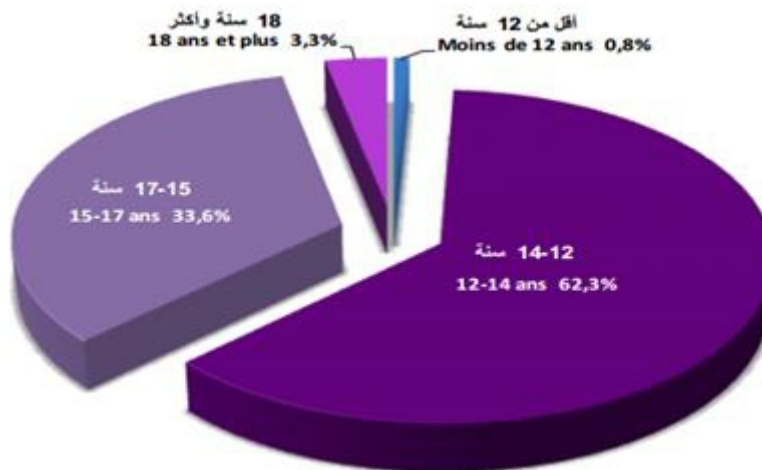**Figure.1 :** Evolution of global data on the secondary college in Morocco

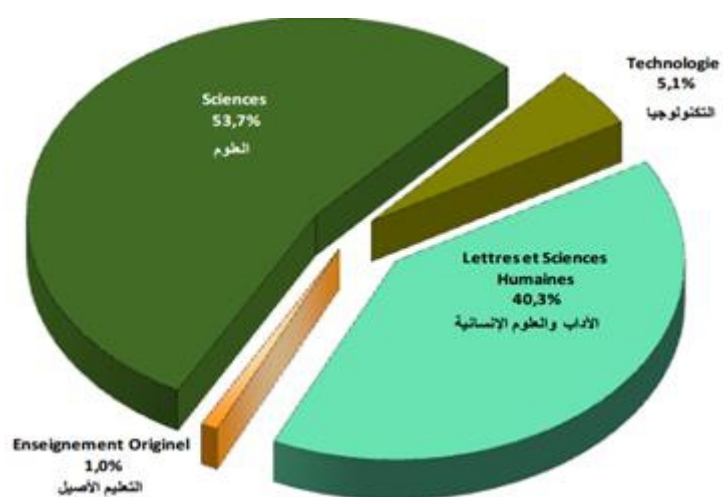**Figure.2 :** Distribution of public school students by college age
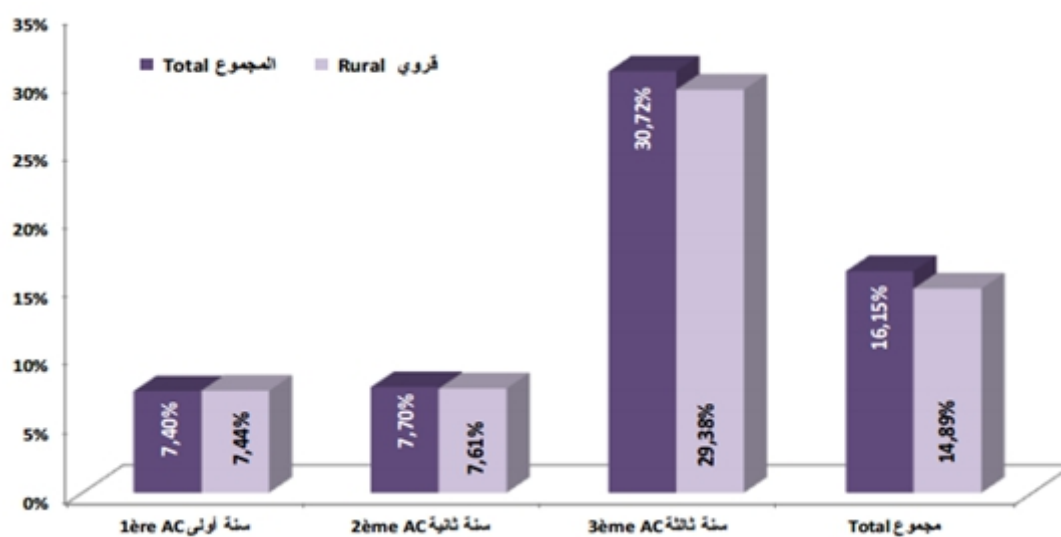
Figure.3 : Distribution of students by branches

Figure.5 : roportion of repeaters in secondary college
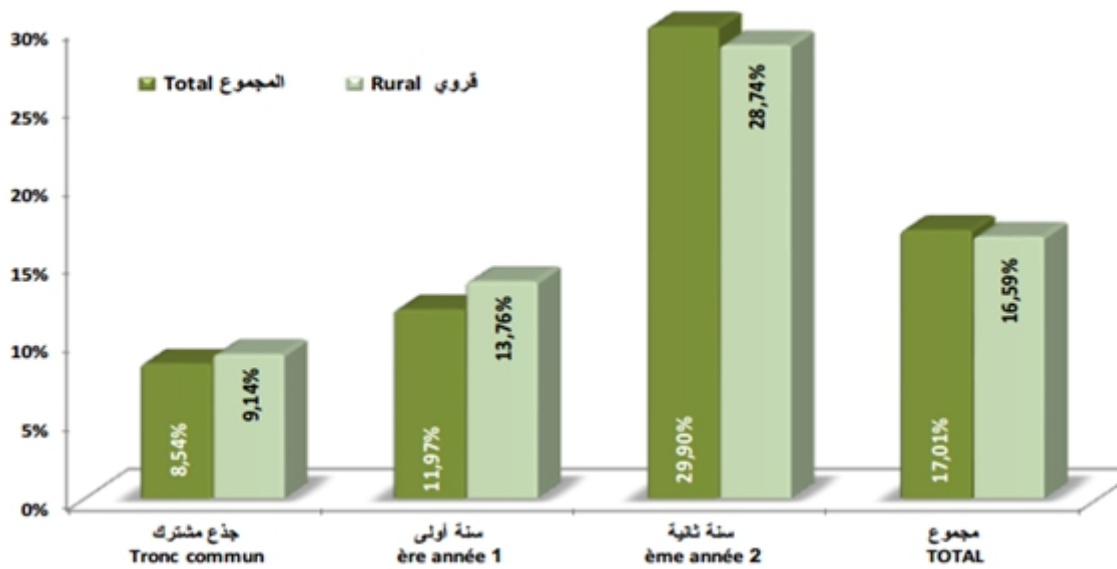
Figure.6 : Evolution of the numbers of graduates by series

Figure.7 : Share of repeaters per level (public) secondary qualifying

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