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# Teaching method by the pedagogy project with Integration of Information and Communication technology (ICT) and work group

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***Abstract:*** *This work reflects a continuous research to ameliorate the learning quality for the high school students, by practicing non traditional methods based on modern and active pedagogy and after last year long work that was about group work to represent a lesson about numeric function for the first year baccalaureate. Now this year it is the turn for the common branch science students after finding out how the level of these students was very weak at Maths. We decided then to introduce this works in the form of a project done by the learners of this level .we relied on three norms:*

- *Pedagogy Project.*
- *Work group.*
- *Integration of Information and communication technology (ICT).*

*But the subject on which the learners are working is related to a statistical lesson that was a real fact help as have an idea to what extent the learning level was evaluated for the majority of learners to get good abilities and capacities to follow their studies with a great perfection*

## I. Introduction

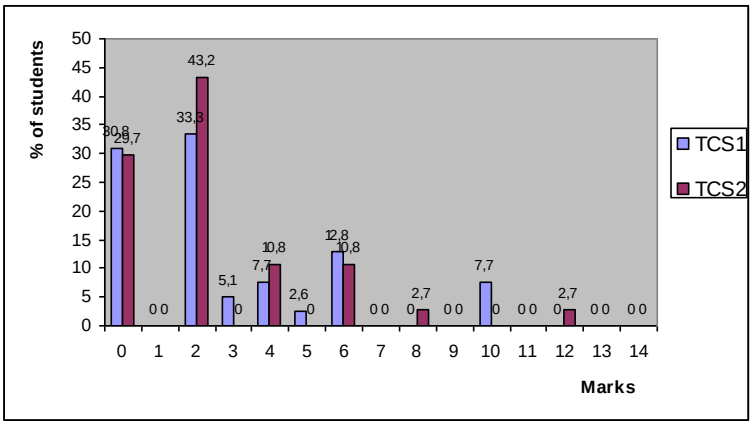
The declining of the learning level for the most of the learners can be considered as an educational phenomenon rooted in all Moroccan public schools and it is increased more and more. It is the common view shared by a lot of people and these who are more interested in the educational issue in our country and the proof is that the last report given by international study concerning the studying acquisition (TIMSS 2011) (TIMSS is an international study of evaluation in both fields Maths and science especially for primary fourth level student and college second level students once in each four years since 1995) .This study put Morocco in the last ranks. The learners are unable to get the last of abilities and capacities to continue their studies in high and acceptable ways our views are based on the results got by the learners in the last given tests the following table concludes the acquisitive results:

| | TCS1 | TCS2 |
|---|---|---|
| **The middle average obtained out of twenty** | **2.74** | **2.72** |
| **The percentage of learners obtained the average 10 out twenty** | **2.56%** | **5.40%** |
| **The higher obtained average out of twenty.** | **10.50** | **11.50** |
| **The lower average out of twenty** | **00.00** | **00.00** |

The following table is about the detailed results according to the main objectives.

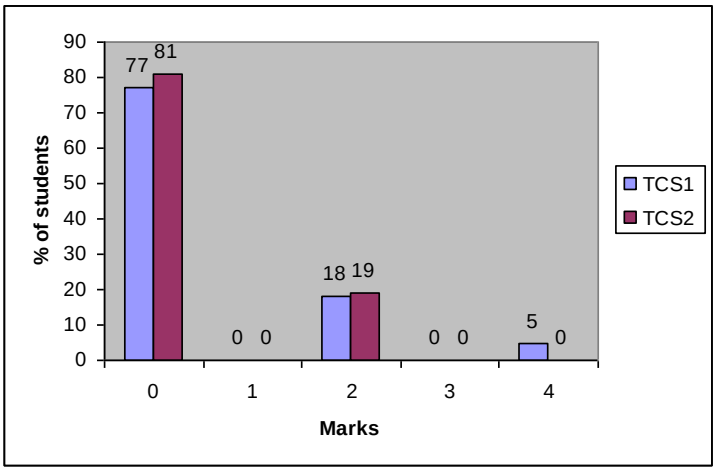
## II. Analyze of results

**1 Numerical activities**



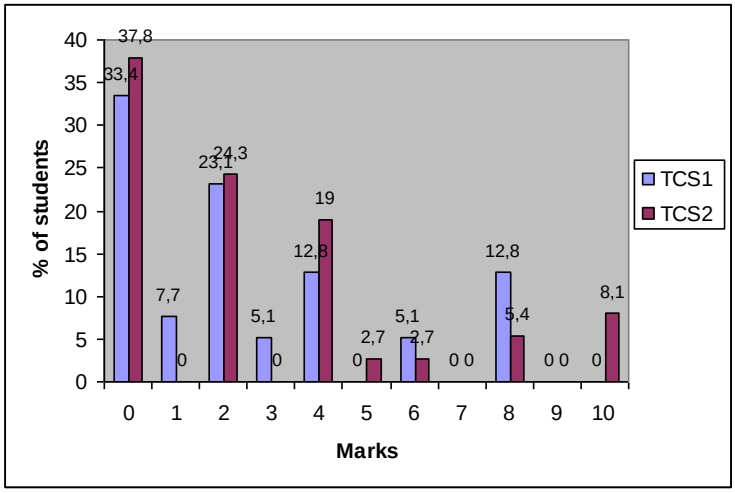

We solve that 73% from TCS2 class and 64% from TCS1 class got the average between 00/14 and 02/14. In fact the average level was limited to 10/14.

**2 Statistical and chartist activities**




We solve that 80% from TCS2 class and TCS1 Class obtained the average 00/04 in fact that the limited level was 03/04

**3 Engineering activities**




We observe that 64% from TCS1 class and 62% from TCS2 Class obtained successively the average of 00/24 and 02/24 in fact the limited level was 18/24; otherwise, the higher mark was 10/24.

It is clear according to the results that the proposed average was not achieved by the majority of the students. This test makes it possible for us to have a clear idea about the weak level of the students from the two classes, because they were unable to grasp the purpose of the given objectives.

In order not to be inactive in front of such situation, we believe altogether in the importance of researches and educational renewal to ameliorate the quality of learning. We decided to deal with an interactive educational research prepared especially for the Common Branch students reflecting the following points:

- To increase the level of the learners and give a sense to their learning by relying on the functional aspect and use it as adequate tool to resolve all problems, but not as a purpose in itself.

- We should deeply give much importance to the learners personal needs such as self-confidence; to be widely open to the others; be practically and psychologically independent; brain activities and critical thought. This is one of the aspects mentioned by the principal document to revise pedagogical programmes published by the ministry of education in our country (White Book for Education and Training).

- Promote the learners capacities to exceed the least ones. Bloom and his fellowers gave priority to knowledge, understanding, and practising to a high level of abilities such as analysing; competing, evaluating and taking decision.

These are objectives if they are achieved and realised that can really lead to a basic formation that can make it be possible to comprehend deeply the reality and to influence it in a positive way that means learners become good citizens in the future that is the major purpose of educational system in our country (The National Charter for Education and Training.).

- To achieve these objectives, we tried to adopt a pedagogical and effective way relying on three principal points such as the pedagogical project, group works; Integration of Information and communication technology (ICT).

These ways are non-traditional in items of learning operation as they are considered as modern pedagogical practises pedagogical project reinforce the sense of research and discovery for learners; moreover, it encourages them to deal with a great independent practice in thinking and controlling their formative trends.

**1- Group work activities**

We mention that we have done an experience last year with Group work activities, we dealt with an experience inside the school we found out that group work learning provide learners with positive facilities for learners in comparison with the traditional practice (Research about : “Apprentice of graphic representation of a digital function to secondary cycle through activities done in group. We also mention that a lot of researchers were well done in this field (le Tonnelier et Mueck, 1990 et Johnson, Johnson et le Forgeron 1991).

**2. The Information and Communication technology (ICT)**

The use of information and communication technologies (ICT) encourages the active and collaborative learning, facilitates the individualized learning and modifies the structure of frontal teaching. The Moroccan Ministry of National Education urged in the National Charter of Education and Training (lever 10) on the usage of ICT:

- Ward, whenever possible, the difficulties of teaching or continuous training linked to the remoteness or isolation of target learners.

Rely on distance education at the secondary and high schools level to remote areas.

-Move towards equal opportunities of access to library resources, databases and communication networks, while solving quickly and cheaply, problems related to inadequate and unequal distribution of documentary resources base.

The national programme of generalization of information and communication technologies in education (GENIE) is part of the broad guidelines of the education reform contained in the National Charter for Education and Training. It aims to improve the quality of education system in Morocco, reduce the digital divide and develop the society of science and knowledge.

This program was established in 2005, it was built around the following axis:

**Infrastructure axis**: implementation of multimedia classrooms connected to the Internet in each school.

**Formation axis**: train teachers and administrative staff to become familiar with computers and improve their knowledge in this field. To facilitate the implementation of the programme "training", the regional training laboratories were implemented and a process of cascade training is developed.

**Content development axis**: it concerns the development of pedagogical content adapted to education in Morocco, as well as the use of ICT contents appropriate and validated. In this context, several actions have been implemented.
It is the development of the pedagogical contents on the national curriculum base, and the establishment within the Ministry of National Education, a laboratory for developing contents.

**Contribution of ICT in teaching mathematics**

Mathematics teaching quality should enable students to understand that mathematics is a living science, in relation to the real world and contributes to the resolution of their problems, away from the stereotypes attached to it in the common culture. This education must afford to live mathematical experience, and for that it must rely on technology and communication information (ICT).

According to Hoyles and Lagrange (2009), technology has undeniably enriched the possibilities for experimentation, visualization and simulation; they have to deal with more realistic problems.
ICTs offer the possibility of a quasi-experimental process in the field of numbers and figures in the plan and space, they provide fast, dynamic and interactive way, a concrete representation in the resolution of a geometrical problem, they facilitate the understanding of many mathematical concepts, they can give meaning to the concepts of the programme (functions (Nachit, Namir, Bahra, Kasour & Talbi, 2012), statistics, probability…) and enable the management of large calculations.

**3- The Pedagogical Project:**

The pedagogy project involves the development of new teaching position or two categories of projects, the teaching and the student can coexist what they were in the traditional disciplinary approach to the teaching learning process based primarily on the cognitive content.

Already in the late eighteenth century, JJ Rousseau in "Emile" (1762) quoted by Michel Hubert (2005) said that: "an hour of work will teach him more than he did retain to one day explanation ".
Further more, John Dewey gave the motto "learning by doing" or action learning.

Project teaching appeared in the educational scene with the notion of project and project approach to 1980.

The project approach, itself derived practical industrial technology and technology training, is introduced into the French educational field since 1989 formally in schools and colleges. I. Bordallo (1993) and applied extensively describes the project teaching in various educational situations.

To achieve our objectives concerning this work; we have chosen a project that reflects a knowledge and definitions related to the study of Programmed statistics for the science common Branch level.

The choice depends on a statistical study which is an important and fertile field acceptable to be practised in the learner's surrounding socially and educationally. Its importance lies in the fact that it is rooted in other learning subjects; moreover, the learners were unable to understand deeply the majority of the given knowledge related to the statistical activities this weakness was discovered thanks to tests done at the beginning of this year (2013-1014).

The subject project is:
**Statistical study concerning the learners results for the second year of baccalaureate experimental Science Physical Science level, and life and human Science level at Ouled Hriz Al Gharbia Scholl concerning the academic exam School year (2012-2013).**

It is a social subject that can interest the learner and attract him because the Academic Exam is a very important event in the learner's life; and this exam is an open door for him towards a final stage after the baccalaureate.

The information concerning the obtained results is disposable inside the school the teachers and the learners are the original references. In fact the learners take part in the achievement of the project after its suggestion.

After the achievement and realisation of the lesson about the statistics and the know ledge related to it such as: calculable average; mediator evaluation, patterns, meditative dispersion; modulation and typal deviation and middle deviation the waver and percentage. In order to give these definitions its functional perspective and to push learners to invest them and develop their abilities to analyse and evaluate to have an extreme freedom for thinking and working; we suggest that they should take up this project. Then after choosing the subject and hand the statistics in to the learners and we ask them to agree about the working strategy and to share the roles, so it is time up to begin working on the project.

**The strategy for working:**

The science common branch students 1 have a responsibility to study statistics related to Physics section and the science of human and life by creating two groups A group where students work manually; whereas, the other group students should use computers. Inside each group roles are shared. At the head of each group there is a student whose job is to create a kind of coherency between the other students and to have a contact with the students belonging to the other groups; another student his duty to report and to edit what is achieved by each group. There is also inside each group a cellule to study and to analyse, and explain statistics about a special subject. At the end of this workshop we collect the results and represent them as a single unit. The representatives of the four groups have to expose them in front of the students, Maths teachers; Maths supervisors parents of students; and some pedagogical authorities. We depend on a partnership approach to encourage students to present the exposure of chosen project.

We choose this sharing system to give much chance to a lot of students to participate although they don't have computers at home and to reflect to what extent computers are important as a pedagogical tool to save much time. During the operation we find out that there is a contraction between the two groups because sometimes bad results are given by students using computers; so leaner begin to have much confidence in their manual activities than a blind confidence in computers.

## III. The project realisation

After agreeing about the work strategy and the sharing roles; all the learners are integrated in the realisation of the project. First they begin by collecting and gathering statistics and information and organise them in a statistical charts after that they try to analyse them by an achieving results. To explain these statistics, they decide to gather some norms and views through a lot of surveys concerning students who had already got their baccalaureate certificate got their baccalaureate certificate and those who are still following their studies to get the Baccalaureate.

The following chart reflects the achieved results for Physics student's level.

| **Scientific subjects** / **Meditative dispersion & Meditative estate** | **Physics** (in the academic exam | **Maths** (in the academic exam | **Science of Human and Life** (in the academic exam | **The three scientific subjects** (in the academic exam) |
|---|---|---|---|---|
| **Pattern** | 0.25 | 0.25 | 10 | 11.5 et 01 |
| **Mediator evaluation** | 02.75 | 8.25 | 11.25 | 09.75 |
| **Calculated average** | 03.75 | 8.15 | 11.39 | 09.39 |
| **Middle deviation** | 02.74 | 4.65 | 2.83 | 04.82 |
| **Modulation** | 12.24 | 29.04 | 12.04 | 31.62 |
| **Typal deviation** | 03.49 | 5.39 | 3.48 | 05.62 |
| **Higher mark** | 16.75 | 19.75 | 18.25 | 19.75 |
| **Lower mark** | 00.00 | 00.00 | 3.50 | 00.00 |
| **Absence** | 0 | 3 | 2 | 1 |

After analysing the results mentioned in the chart above, the learners conclude that the results are below the average concerning the three scientific subjects by observing that Physics marks are the weakest even if 50% of learners get the average of 08,25/20 in the three scientific subjects that push learners it analyse results obtained in the regional exam concerning both students who fail on those who succeed.

To compare the results obtained in the regional exam and those obtained in the academic exam the following chart conclude that:

| | **The three scientific subject in the academic exam** | | **Regional Exam** | | **Assignment** | |
|---|---|---|---|---|---|---|
| | **Successful students** | **The unsuccessful students** | **Successful students** | **The unsuccessful students** | **Successful students** | **The unsuccessful students** |
| **Pattern** | 11 | 0,25 | 10.45 | 9.05 | 16.22 | 10.29 |
| **Calculable average** | 11,37 | 5,25 | 10.90 | 07.94 | 15.59 | 12.45 |
| **Mediator evaluation** | 11,75 | 4,62 | 11.35 | 07.75 | 15.52 | 12.88 |
| **Middle deviation** | 4,03 | 3,64 | 2.14 | 01.78 | 0.9 | 01.32 |
| **Modulation** | 23,12 | 17,57 | 7.09 | 05.08 | 1.31 | 04.84 |
| **Typal deviation** | 4,81 | 4,2 | 2.66 | 2.25 | 1.15 | 2.2 |

To analyse these statistics; learners find out that assignments results are better than the regional exam and the academic results and that these assignments have no negative impact on the learners success or failure.

The surveys show that the causes of these results are:
- Students are unable to grasp the content of the baccalaureate programmes.
- Learners neglect the scientific subjects at the first year level.
- Bad orientation for some learners.
- Complications concerning the subjects especially physics.
- During the academic exam learners live under a great pressure, especially the first day (Physics subject); whereas, during the given assignments learners relaxed.
- Lack of a serious revision from the beginning of the school year, learners rely only on what is given in the class by the teacher.

The difference between Maths and science of human and life results from one hand; and Physics results on another hand we observe that the nature of the questions because the given questions about science of human and life depend extremely on reciting by heart, but the given questions about Maths are direct; on the contrary given questions about Physics need much efforts from learners to understand them deeply; moreover, learners should know how to analyse these questions which many learners lack.

**The difficulties learners face during the project**

As we know a lot of difficulties and complications can hamper the realisation of any project, but the learners' ambitions and motivations can reduce and eliminate these difficulties.
Some of these difficulties are:

- Learners find it difficult to profit from the multimedia classes because they are used only for teaching information technology.
- Few laps top computers. They contain programmes different from "Windows". There is a laptop that has a Spanish programme.
- Time consuming is another obstacle because learners have different time tables.
- Learners find it difficult to use Power point and Excel programme. They surf only by using " Facebook".
- Some learners find it difficult to integrate themselves in the group work from the beginning of the project.

**The positive effect of the project on the learners**

During the realisation of the project we willingly observe how learners are serious motivated and how they are effectively participate. We can resume the benefits they get from this project according to following point:

1- Their abilities to use Power Point. Excel and word.
2- The perfect use of internet by using "Facebook" to discuss and to exchange the data and searching other knowledge related to project.
3- To have a sense of responsibility and to develop a sense of co-operation and to accept the other people's views.
4- To deal with a pertinent criticism and to create hypothesis and to analyse the surveyed people's opinions.
5- To have a capacity to know how to get marks and notes during the research.
6- To gain a self-confidence and to have audacity to communicate with the others.
7- To grasp the functional extent of the knowledge suggested by the lesson and to know how to have abilities to resolve issues and problems from other studies.

## IV. Conclusion

We sum up that how this way is very workable to represent learning subjects and topics and how it has a great and beneficial effect on the learners' level. Learners get abilities, capacities reflecting different aspects: what is spiritual thoughtful and gestic intuition which rarely happens in traditional practices where learners depend only on the knowledge side which cannot lead to a good acquisition.

For this reason we suggest learners should adopt like these ways and to expand the work by integrating more than one subject and to establish a coherency among teachers and learners become conscious about the complementary of all subjects they study and learn at school its purpose is to enrich their learning needs and to build up a good personality able to be easily integrated in the labour life.

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