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Teaching And Learning Of Experimental Science: The Case Of Chemistry In Secondary Qualifying Morocco.

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Abstract

Teachers and students are the main actors in the educational action. The teacher is primarily responsible for the transmission of knowledge. The action of teaching is essentially to bear on the mental representations of students in order to find an entry in their cognitive systems developed. However, achieving this goal is not obvious, and common methods of teaching are not always effective. Thus, obstacles persist with regard to the education of students and hinder the educational action. Thus we conducted observations in classroom situations. We stopped with volunteer teachers who had scheduled sessions with their pupils. The research was based on an observation checklist dealing with the following topics: the approach taken by the teacher throughout the lesson, the user operating and alternation and the quality and appropriateness of the content. The analysis of the results of these observations shows the existence of a large number of obstacles to the realization of effective teaching of chemistry in Moroccan schools.

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1. Introduction

In the teaching of science in general, and chemistry in particular, the main mission is to help students develop an understanding of the natural world and its phenomena from a scientific approach. Notwithstanding, there seems to be a malaise in the teaching and learning of chemistry. The discipline appears to be recognized by learners as involving difficult teaching approaches used are cumulative. Students and even students ‘..teachers ..’ PERHAPS? memorize more than they understand, and find it hard to relate the different theories, the problematic use of

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symbolism, and some dissatisfaction of on the part of teachers (Bhattacharyya & Bodner, 2005; Bowen, 1990; Ferguson & Bodner, 2008; Zieba, 2004; Loumouamou, 1998). It is therefore wise to determine to what extent the methods of teaching chemistry contribute to the conceptual organization of students, and to determine what are the areas that need to be improved in terms of the teaching of chemistry in our schools. To achieve our goals, we conducted observations in classroom situations. Our research is not limited to a diagnosis of the system of teaching chemistry in Moroccan high schools and to identify the difficulties and obstacles that are encountered, but also extends to the making of practical suggestions to remedy the deficiencies that hinder the relevance of the contribution of the education system in this area, and to improve the teaching and learning of chemistry.

2. Methodology

As part of qualifying secondary science education, Moroccan chemistry courses are delivered from a common scientific and technological standpoint. Thus we focused a significant portion of our research on the analysis of barriers to the teaching of chemistry for this level. It should be noted that although the concept of chemical reaction is a fundamental element in the teaching of chemistry and in the transformation of matter, it is linked to almost all chemical knowledge. However, although this concept is familiar, studies have shown that it remains far from being properly identified by its users (Solomonidou & Stavridou, 1987; Stavridou, Solomonidou & Papademetriou, 1993). This is why we chose the teaching of “modeling processing chemical-table” as part of the science and technology common framework, to make observations in classroom situations. We observed volunteer teachers who taught scheduled sessions in class situations. Six schedules were agreed. These involved six teachers in three schools using an observation checklist on the following topics: the approach taken by the teacher throughout the session, the operating mode and alternation and content quality and appropriateness.

3. Results

The analysis of the results contained in this paper shows the existence of a large number of obstacles to the realization of effective chemistry teaching in secondary schools. It also appears that the approaches of these teachers are generally similar:

- Definition of concepts;
- Modeling the transformation;
- Balance of material.

These teachers evaluated their students' acquisitions throughout the sessions by the use of oral questions and exercises. All volunteers gave their teachers in a traditional dogmatic way and no experience has been made. ‘..All the teachers taught in a traditional dogmatic fashion, with no practical work being involved The majority of the examples of chemical transformations involved combustion. Their arguments have been paid by the program, the lack of equipment needed to perform the experiments and examples which they were shown in college. The latter weakness is a major obstacle to the success of educational action and requires special attention both from the teachers and on the part of officials.

4. Conclusion and proposals

The observations we conducted in a classroom situation allowed us to note that the volunteer teachers made use of an approach that was mainly based on the transmission of theoretical knowledge. The chemical reaction is given to the student as a series of rules for them to apply. The teaching of chemical reactions in this way departs from the scientific approach used in experimental sciences. We propose to integrate the programmes UK SPELLING of home duties as achievable home chemistry experiments. This innovative approach would allow, on the one hand, the ability to spark students' interest in innovation, creativity and scientific research, and, on the other, to introduce a scientific and chemistry culture, thereby increasing the degree of familiarity with materials and even a degree of admiration of the processes involved. As we have pointed out, it would be necessary to restore a balance between the students and the school, between students and knowledge, and the development of "bonding" appreciation of the material. The goal that we seek to achieve through the use of these activities is not only for the development of enjoyment of the topic but also to arouse the curiosity of the students which would then stimulate further research on

what we have developed studies ‘.on studies which we have developed .We hope that students will not be limited to operational aspects of these experiences, but will also try to find time to study chemistry texts in order to acquire the basic concepts. The knowledge they gain will also allow them to continue with such experiences, going deeper into the fun and knowledge of the subject. Indeed, it is obvious that they can better enjoy activities like this when they have learned about atoms, molecules, valence, different types of solutions, electrolytic dissociation, and other chemistry concepts. It is also possible to propose experiments that can be achieved, especially with compounds of everyday life, or industrial compounds available on the market. For most young people, adult supervision is required. Similarly, the teacher should choose the experience that will be conducted according to the level of the students, and will provide them with all the necessary explanations. When selecting experiments for students to experience, either through manual or on a voluntary basis by teachers, it is necessary to observe the following precautions:

- Hazardous substances and strong acids and bases should never be used.
- Chemical products should not be put in food containers such as cups, glasses, bottles, plates or in any other way that there is a risk of being mistaken for drink or food.
- Beakers and utensils should be cleaned at the end of the experiment and bottles containing left over substances that we want to keep, should be placed in an appropriate place, out of reach of children. Such containers should also be marked with the name of the substance contained inside, and its toxicity.

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