Barriers To Learning Physics In Moroccan Secondary College: The Case Of Student’s Representations In Electricity.

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Abstract

The objective of this work was to identify some representations of the Moroccan college students in secondary electricity. However, school learning is an area where the contribution of the representations is necessarily linked to the performance and results of students, which complicates the task of the teacher and it drives him to seek methods and teaching techniques to help students overcome and change their misconceptions. It should be noted that the representations students develop every day and every year, in the right way or the wrong way. That's why teachers should consider the representations of their students during the teaching and learning of science subject such as physics and chemistry.

Keywords: obstacles, teaching, learning, representations, physics, chemistry, electricity.

1. Introduction:

The majority of physics and chemistry teachers do not take into account the preconceived knowledge of their students in the teaching-learning situations, which thus explains the learner acquires an illusion of scientific knowledge. Thus it seems important not to overlook the preconceptions of students. Therefore, we must find ways to change these representations to install a quality physical education science.

Electricity is one of the basic areas of physics which is important regardless of the educational level. In primary school, young children gain experience with Simple electrical circuits. The following levels electricity is systematically taught and is an important theme. Thus we chose to carry out research on the representations of Electrical students.

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2. Representations as barriers to learning:

The performances are explanations for any phenomenon. They are called: preconcepts, already there conceptual, initial ideas, first speech... By engaging in formal education, the student already has a set of representations that involve various treatments because they constitute knowledge. These representations are the cause of obstacles that have to manage to ensure educational activities capable of inducing the learner lasting and meaningful knowledge.

Bachelard (1938) is one of the first who was interested in the study of representations or mental conceptions of the students, he quoted: "I have often been struck by the fact that the science teachers, even more than the other if possible, do not understand that we do not understand. [...] They have not thought about the fact that the young person arrives in the physics class with empirical knowledge already established. This is so, not to acquire an experimental culture, but to change the experimental culture, overcome barriers already piled up by everyday life."

A significant representation of students is that they allow them to have a world of reading grid (Giordan, 1996). This allows solving problems by implementing "cognitive strategies" (Stop, 1992). They are very practical in that they are able to explain some things which they have no experience sometimes (Develay 1992).

The teaching-learning situations that do not take into account such representations would be unconvincing for the student. Alternative preconceptions can be a major barrier to assimilation of the new scholastic knowledge.

3. Some examples of student’s representations for electricity:

For children, the electricity is something that is stored into the sockets, batteries, and produces a spark of the bulb, an electrical appliance.... They recognize the existence of this one and its effect but do not know to explain it.

Thus Delacote and Tiberghien (1976) noted that students are aware of the existence of electricity in batteries and this produces electricity lighting the bulb without being able to give an adequate explanation of the phenomenon.

In this sense, Dupin and Joshua (1988) state that "Electricity is considered a fluid flowing in pipes, just like the water in a plumbing system." Also Duit, Reinders and Rhoneck (1998) state that children have a conception of stack "that must be emptied."

Dupin and Joshua (1988) state that for children: one end of the bulb is considered active.

This idea of unipolar current was reported by Duit, Reinders and Rhoneck (1998) when they say that students "believe that a single wire between the battery and the bulb could turn it on."

4. Study practice:

4.1. Methodology:

In this research, data collection is based on a questionnaire sent to college high school students. The research sample consisted of 66 students of the college Moroccan secondary education.

This questionnaire focuses on the nature of electricity, its production and its passage in electrical circuits.

4.2. Results:

According to the answers:

- 53 students (80 %) think that the electric current flowing in like water and the representations in social conceptions because the student thinks that the electricity flowing through the pipes in the domestic installation.
- 60 students (91%) think that the electric current absorbs the blood of humans and this idea has a social origin because the person is stuck attached to the live wire when it is electrified.
- 58 students (88%) think that electric power is hidden in the generators; this representation is due to a social conception considering the come an electricity generator tank (or particles, or free electrons, depending on level) and the rest of the circuit is starting to vacuum which will circulate it.
- 44 students (67%) believe that the electric current is a black substance that is found in a given generator found it inside the cells.
- 50 students (76%) believe that the production of the battery current is through the two poles, saw logs (and not due to a chemical reaction
The responses show by pupils of Moroccan colleges in the field of electricity, hence the need to take them into account to put the learner at the center of learning and see what he knows or believes to know about subject, and then determine what potential obstacles.

5. Conclusion

The objective of this work was to know some performances of students in the field of electricity. To ensure that students are on track to failure because of false representations, the teacher is supposed to be aware of the value of their representations in any learning instrument and must make a great effort and seek teaching methods and techniques to help students overcome and change their misconceptions.

References