Chapter 15
The Use of Concept Maps in Environmental Study

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ABSTRACT

This chapter seeks to find a pedagogic tool that can help a learner a secondary school Environmental Study class. More specifically, the purpose is to shed light on a positive effect of these maps on students' metaknowledges and on their overall understanding. Moreover, the point is to try to find if the teaching method of concept maps can have a different impact on the acquisition of metaknowledges and on overall understanding. Indeed, the researcher emits the hypothesis that a teaching method accompanied by a pedagogic dialogue can have more positive effects than an only expositive teaching method. Through a serial of workshops of concept maps' teaching and tests, the researcher has determined that concept maps teaching, regardless of the method employed, can have an impact on overall understanding in Environmental Study, which is a real benefit to our reflection on professional practices. And more, it appears that the teaching of concept maps by the expositive method may have a positive effect on the overall understanding of Environmental Study.

INTRODUCTION

From Metacognition to Concept Maps

How do we learn? What do we know about learning? These great questions, many experts in Educational Sciences have asked them. Actually, one of the big ways of research in Education is to offer to the learner to become aware of knowledge and efficient learning's strategies which he already possesses and to teach to use them in an appropriate way.

Indeed, studies (Flavell, 1987; Lancelot, 1999; Doudin & Martin, 1992, quoted by Romainville, 2000) have shown that weak learner isn't conscious about that he knows.

Sometimes even, he doesn't know how he did it to success a task and so he ignores how repeat this success. Learning to the student to be aware about that he knows, how he knows, how he memorizes, how he solves a problem, how he learns… it's teaching him the metacognition.

The metacognition has although aroused multiple debates, this last thirty years, by educational searchers, since Brown (1987, quoted by Escorcia, 2007), Flavell (1987 & 1992, quoted by Escorcia, 2007), Zimmerman (1995, quoted by Escorcia, 2007) from to Bessette & Duquette (2003) and Derycke (2005, quoted by Broyon, 2006).

The professional experience showed to the author that some tools can be used to teach metacognition, like mind mapping and other spatial representation of knowledge, and have a growing success but, however, stay somewhat unrecognized and not mastered by teachers. Bessette & Duquette (2003.p.5) affirm that "the reality of average age of teaching staff just as the recent evolution of neurosciences, of cognitivism and socioconstructivism, which have got a major impact on the articulation and the understanding of reflective and metacognitive phenomena, it's a safe bet that very few teachers have got occasion to teach and develop these skills explicitly."

Is there a practice favoring metacognitive reflection? The author present to what extent La Garanderie's works (1984, 2013) about the pedagogic dialogue that can bring workable option for the teacher who wishes to develop the metacognition with his students.

In the last researches in Education (Doudin & Martin, 1992, Grangeat, 1997 quoted by Romainville, 2000), they have shown that the progressive metacognitive skills' acquisition can help the student to pilot his learning. Such skills may be, partially, acquired in school, thanks to metacognitive tools, such as logbook or concept maps.

In what concept maps could they constitute a metacognitive tool in the service of the teacher and the student? This research presents the concept map (Novak, 1990) and its use as learning and metacognitive reflection's tool. However, these tools can really extend the teacher's practices and promote the success of more students.

Articulating that with a professional experience, the researcher wished to highlight the use of one of these metacognitive tools, the concept map. It's a spatial representation of concepts linking and organizing these one by significant links. More particularly, she wished to check if the use of concept maps, as a metacognitive tool, in the framework of a first class of secondary school, in the class of Environmental Study, can help students to build a global sense and to develop metaknowledge.

However, having already tried concept maps development with first class of secondary school's students, she could note that conceptualization isn't mastered by all students. Therefore, to visualize and to read a map request a real learning, this can take from a few hours to a few weeks. The students' age, their general level of knowledge, their initial representations, their profile (visual or auditory preferences), their reasoning, etc. are so many parameters can vary the required time to good tools mastery.

So, the author hopes to open an additional way for the teacher who wants to equip himself with innovative pedagogic tools, in the French-speaking Belgian education system. With that in mind, she wants to bring the light about possible effects of the use of concept maps, on the one hand, when it is taught with an expositive pedagogic method and, on the other hand, when it is used as support in a metacognitive reflection.

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