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CONCEPTUAL MAPPING IN THE INVESTIGATION OF THE VIEW OF ELEMENTARY SCHOOL TEACHERS ABOUT TEACHING, LEARNING AND EVALUATION AND THE INSERTION OF THE TECHNOLOGIES IN THE SCHOOL SPACE

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Abstract. This research states that the opportunity for teacher's reflection regarding their own learning, teaching and evaluation concepts, through Conceptual Maps, can potentiate his pedagogical work with the resources offered by the web in the teaching and learning dimension by using the computer with their students. The option for the use of the strategy of conceptual mapping aimed to value the teacher's previous knowledge (David Ausubel´s Meaningful Learning Theory) and to provide paths to review his own practice, revealing subliminal aspects of the concepts that he has been adopting and the form he has been relating theory and practice in his scholar routine. We could observe that the development of conceptual maps made possible for teachers to express concepts that compose his practice in the daily of classroom, besides creating conditions for reflections starting from a glance about the existent relationships between their concepts.

1 Introduction

Teachers used to finish their college ready to exercise their academic activities for years. Nowadays a permanent skills update is needed to continue their formation under the perspective of a long life-learning, thinking about the pedagogical use of the virtual environments and communities.

However, as Kinchin (2008:5), points out "instead of impose to the teacher how he should act, (...) it is necessary to make explicit how he already acts", leading him to become aware of their own concepts on teaching, learning, evaluation and use of technologies, and so adjusts and transformations within his practice can come from himself. Due to the technological resources, eventually the teacher cannot find a way to apply his previous knowledge, and he decides to look for ready and modern activities. It may satisfy as technological performance, but not being appropriate for the content of his discipline and his teaching and learning goals.

So, conceptual mapping in our research is a special tool to instruct teachers in service for the use of new technologies in class, respecting their previous knowledge and providing them ways to reflect about their own practice, revealing subliminal aspects of the concepts that they adopt and how they relates theory and practice in their classroom everyday.

2 Theoretical Background

This work leans on the following concepts: previous knowledge of the David Ausubel´s Meaningful Learning Theory (1978); Novak & Gowin´s conceptual maps (1984); the common places of the education described by Novak & Gowin (1984): teacher, learner, curriculum, milieu, thinking, feeling and acting; the Ian Kinchin´s three types of conceptual maps (2008) (spoke, chain and networks); Edgar Morin´s Theory of Complexity (2005); Paulo Freire´s concepts (2001) like freedom, autonomy and dialogue.

The step ahead that we intend to take with this work is the adoption of a methodology generated from the teacher's interpretations for the teaching, learning and evaluation concepts, making him to think on his role as educator. Such reflection will be done developing on the teacher the concept developed for the student of Novak & Gowin´s learning to learn (1984). Starting from the common places described by Schwab (1973) - teacher, learner, curriculum and milieu - and also Novak & Gowin´s thinking, feeling and acting (1984), we intend to make the teacher to become aware through the construction of conceptual maps, about their own teaching, learning, evaluation interpretations and the use of the computer in the school education. In agreement with the thought of Morin's complexity (2005), we think

the teacher's in-service process for practicing can make teachers conscious about how he has been acting, and not an arsenal of criteria to be followed to change his form of acting. Thus, the teacher´s (conscious) acting can assume the starting point to the construction of his new knowledge about the use of the computer in the school education.

Through Joseph D. Novak and D. Bob Gowin´s conceptual maps (1984) the teacher can contemplate and dialogue with himself and with his pairs, bringing to the surface subliminal relations between previous knowledge and new knowledge. Through Novak and Gowin's statement (1984:6) "the education experience is a complex event". The "four common places of the education" discussed by those authors - teacher, learner, curriculum and milieu - support our study on the teacher's view regarding teaching, learning and evaluation and the insertion of the technologies in the school space.

3 Methods and procedures of the research

The methodological course adopted in this research aims to accomplish the objective of investigating the teachers' view on teaching-learning, evaluation and how the use of the computer in the school education follows the empiric line of the research-action, presenting participative/cooperative relationship between researchers and participants (Thiollent, 2005).

The impact of the strategy of the use of the conceptual mapping to investigate the teachers' interpretation about teaching, learning and evaluation and the insertion of the technologies in the school space was focus of reflection of this research.

This work is about a short term course (4 weeks) - "Conceptual Mapping in the School Education" - offered to the municipal teachers of Balneário Camboriú, in September-October/2009, with the aim of investigating the teachers' interpretations about teaching, learning and evaluation through conceptual mapping. Classes had an hour and a half of duration, for 4 weeks, with 11 participants. The classes were offered at the Computers Laboratories, and Cmap Tools was used. The conceptual mapping was the strategy used to make the teacher express his tacit knowledge of the content, his educator role, his current practice and his intentions using the available technologies in the school where he works.

In the first week, the teachers practiced how to manage with Cmap Tools. During the last three weeks of the course the teachers developed six conceptual maps individually. Firstly maps were developed approaching the following issues separately: teaching, learning, evaluation, use of the computer in the education. Afterwards maps were developed approaching contents of the disciplines supplied by the teachers. Finally, the four themes were approached in a same map.

4 Some data analyses

The analysis of conceptual maps adopted by Kinchin (2008), classifying them as spoken, chain and networks, lead to the work we have been developing in our courses and make explicit the teacher's work in the classroom everyday.

The conceptual maps created by the teachers were analyzed also in comparison with the model Labudde (2007), that considers forms, themes, interdisciplinary competences, the teachers' roles, methods and evaluation. As the period for development of the maps was considerably short (four weekly encounters of 1hr30min), the teachers studied the resources of the tool and we could observe maps with varied approaches and forms.

Concept mapping helps us to think about the problem under the aspect of the thought of the complexity, taking in consideration the other one and the previous knowledge of each element of the process, avoiding the "blind intelligence" way (Morin, 2005), that is result of a simplification that judges irrelevant elements that should, combined, contain solutions for a certain problem.

Conceptual maps produced by the participants (about the concepts Teaching (1st cmap), Learning (2nd cmap), Assessment (3rd cmap), Computer Use (4th cmap) and Final Map (5th cmap – relation among all the 4 concepts) were analysed based on Ahlberg & Ahoranta (2008), considering the sum of relevant concepts and relevant propositions.

		Sum of Relevant Concepts					Sum of Relevant Propositions				
Partici-pants	**Sex**	**1st. Cmap**	**2nd. Cmap**	**3rd. Cmap**	**4th. Cmap**	**5th. Cmap**	**1st. Cmap**	**2nd. Cmap**	**3rd. Cmap**	**4th. Cmap**	**5th. Cmap**
Patricia	F	4	6	8	6	5	1	0	0	4	4
Angela	F	11	6	3	8	7	5	3	1	4	6
Sergio	M	4	4	3	6	5	4	1	0	0	7
Lise	F	7	7	4	5	6	4	3	2	2	5
Vera	F	4	6	6	6	5	2	7	5	0	5
Taíde	F	6	5	4	5	5	5	4	3	3	6
Geral-da	F	7	7	6	5	6	6	6	5	4	4
Rita G.	F	4	7	6	6	11	2	5	5	5	6
Edeval	M	5	5	6	6	10	2	4	6	5	7
Roseli	F	5	8	5	7	6	4	7	4	6	5
Vera	F	4	3	6	6	6	1	2	6	2	5

Table 1: Relevant concepts and relevant propositions

According to the Ian Kinchin´s three types of conceptual maps (2008) (Spoke, Chain and Networks):

Participants	**Sex**	**1st. Cmap**	**2nd. Cmap**	**3rd. Cmap**	**4th. Cmap**	**5th. Cmap**
Patricia	F	N	N	S	C	C
Angela	F	S	S	S	S	S
Sergio	M	N	S	S	S	N
Lise	F	S	S	S	S	S
Vera	F	S	N	N	S	N
Taíde	F	S	S	S	S	S
Geralda	F	S	S	S	S	N
Rita G.	F	S	S	S	S	S
Edeval	M	C	C	C	C	C
Roseli	F	S	C	C	S	C
Vera	F	S	S	C	C	S

Table 2: Kinchin´s three types of Conceptual Maps (Spoken, Chain and Networks)

All the concepts and propositions used in the conceptual maps were gathered according to the concepts of "Common Places" (CP) (Schwab (1973) and Novak & Gowin (1984) - related to fundamental elements in the teaching and learning process; and "Cognitive Skills" (CS) – related to the student´s cognition process; "Affective Skills" (AS) - related to the affective relation between teacher and student; and "Conative Skills" (ConS) – related to the action of the teacher towards the teaching and learning process (Raven, 1984).

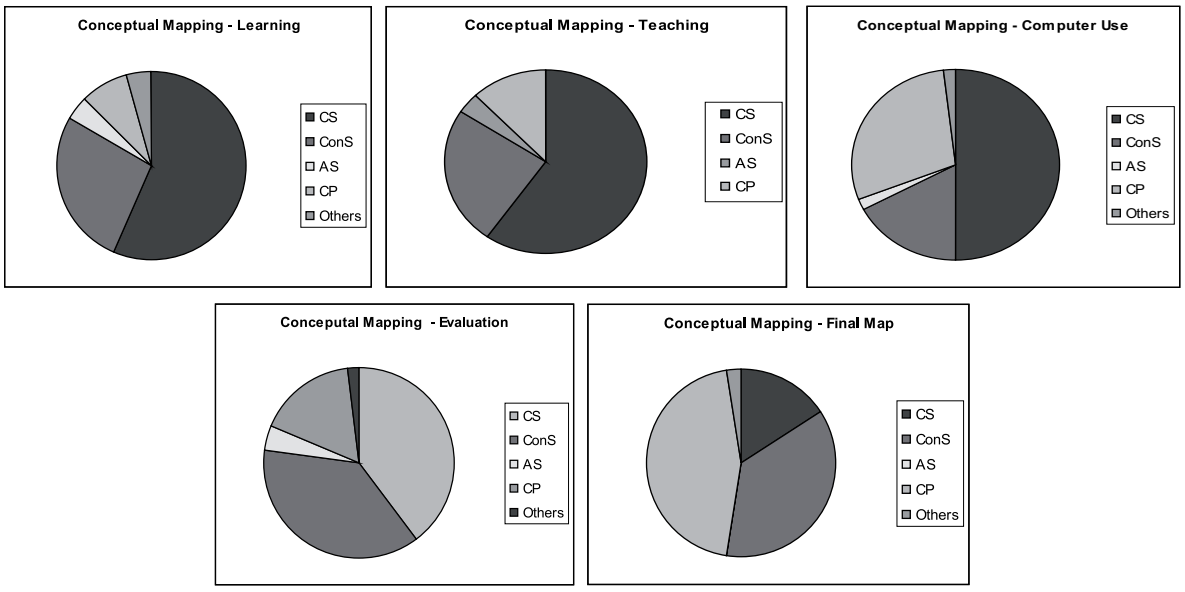

Figure 1. Graphics about concepts and propositions gathered as Cognitive Skills (CS), Conative Skills (ConS), Affective Skills (AS) and Common Places (CP)

5 Partial Results and Conclusion

There is similarity among both number of concepts and propositions in maps produced by each participant, in spite of the issues of the maps.

Propositions were not fully used in the maps. Some participants did not even use them. In these cases they say not to see relevant comprehension in using them in their maps.

The total number of conceptual maps types was: Spoken - 35; Chain - 12; Networks - 8. In spite of the situation, the spoken maps were the most used ones. Some participants prefer to use some type of maps, specially according to their experience and cognitive skills. We are still working on some relations between cognitive skills and type of maps.

Cognitive skills are emphasized in the maps about teaching, learning and computer use: participants demonstrated conscious about the fundamental role of active students in the teaching and learning process in actual days, using the new technologies. In the conceptual map about evaluation both cognitive and conative skills are emphasized, demonstrating such a balance between the role of both teacher and student in this process. Common places are emphasized in Final Map, which maybe means that so many things seem to be changing but everything is the same in essence.

6 Discussion and future work

Our investigation has pointed to the urgency of measures that favor the teacher's formation in service. It should be made a continuous work that develops skills and competences for the relationship between the teacher's previous knowledge and the pedagogical use of the technologies.

The valorization of the teacher's previous knowledge is essential for the success of any measure for the insertion of new technologies in the school environment.

There is still a lot to be done in the sense of offering subsidies to the teacher that make possible to him the reflection and the awareness that the only way to transform the mechanisms of the teaching and learning process is valuing the education knowledge that he already possesses. By this path we can walk heading for a contemporary education that assists to the needs and longings of the modern society.

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