TEACHING CONCEPT MAPPING TO CHILDREN IN VERY DIFFICULT CIRCUMSTANCES. AN EXPERIENCE

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Abstract. The following article describes an experience of concept mapping in a first primary class of a school where there is a students at risk of scholastic failure' high rate. Moreover, it seeks answers to two questions: does it pay to teach concept mapping to those children called by UNICEF "children in very difficult circumstances"? And why could be important to teach them it: to improve their cognitive performances only? Or this meta- cognitive strategy – together with other appropriate strategies of teaching - can help students at risk of scholastic failure to improve their emotions, self-assessment, social competences too? We are persuaded that an high level scholastic education, can help children "in very difficult circumstances" to improve all their competences and increase their chances to break chains of the indigence, crime and social marginalization in future.

1   Introduction

We are Patrizia Venditti and Carmela Sabba, respectively head teacher and teacher of mathematics and science in a primary school situated in a depressed suburb of a south Italy's city, Giugliano in Campania. The students of our school often have a shocking social, cultural and familiar background: statistical data gathered by our Evaluation Committee of School, say that the 72% our students' parents have a primary school certificate and only the 3% obtained a degree. In according with our data, then, the 23% of parents is unemployed and the per cent of familiar income lower than threshold of poverty (12.000 euro) is 60. In this depressed situation, children often receive no appropriate familiar cures and their scholastic, cognitive and social behaviours aren't correct. A lot of them have a poor vocabulary or speak slang only; refuse scholastic regulations and achieve a rote learning. A significant per cent of these students don't goal the compulsory education. During previous five years, the school tried to find fitting solutions to by-pass both this depressing situation of our students and the risk of premature teachers' burn – out and their progressive loss of professionalism (because the lacking returns of their work..) too. Leitmotivs of the research have been the notion of meaningful learning and the analysis of J. Novak on the elements that influence the scholastic successes: the pupil, his familiar and social background; the curriculum; the teaching; the scholastic organization and the valuation system. In according to this analysis, our hypothesis is that children in very difficult circumstances can goal high level of meaningful learning if schools offer them, at the same time: a) an appropriate and personalized curriculum based on logical, linguistic and social abilities; b) an flexible organization, in particular regard on school hours and multiplicity of activities and services offered; c) an high professional quality of teaching; d) an evaluation system for the learning. And, above all, if schools accept and valorise anthropological culture of children; give pupils, at the same time, strong instruments to learn how to learn and good motivations for learning. Throughout the years, our school has tried to act on every single one variable of educational process; in the present school-year, a group of teachers have carried-out a plan to test the effects of the simultaneously use of concept mapping - cooperative learning - laboratorial learning on social, logical, scientific and linguistic abilities of their pupils. The complete results of this research aren't yet available: therefore, in the following, we just limit to illustrate teaching strategies used in a first class of primary school to improve meta-cognitive, linguistic and scientific competences. It is worth noting cooperative-groups referred to the following are set up by children having different intelligences, according to the theory of Gardner: for us, this particular composition of the groups, makes possible to each child to express its abilities, improves self-assessment and encourages it to engage, little by little, in less agreeable activities also.

2   The class

In the beginning of the school-year, after the procedure of assessment about students' abilities (cognitive, social and meta-cognitive) and their kind of intelligence, the 22 pupils of the class could be classified in three groups, different each other for kind of intelligence, cognitive and relationship competences of the members. The teacher identified a fair number of pupils at risk, too.

1) the first group, were constituted by children having a developed logical and linguistic intelligence, good social competences and an high level of attention. In this group the less developed intelligence was the bodily one;

2) the second group , were constituted by children having good logical and bodily intelligence, but were short in linguistic competences. A lot of them spoke slang only. Also the social competences were short: they were aggressive towards things, other children and adults. The times of attention were low and the motivations for learning too.

3) the third group were constituted by children having deficient linguistic competences, lacking logical, social and bodily intelligences. The times of attention were low and they seemed to have no motivations for learning .

Moreover, in the class there were two children, a boy and a girl, that presented a lot of problem concerning affective area, relationship area and cognitive behaviour. The boy, S., lives in a family where there are five persons; his father – an ex-prisoner - is actually unemployed and both mother and father are not able to write and read. He showed an hard aggressiveness toward people and things, refused to stay in the classroom and to participate in scholastic activities (in particular, he refused to write and read). Often, he got away the classroom pursued by teachers and school caretakers. His clothes and body were frequently dirty, unsuitable, he was so pallid and thin that seemed underfed. For these reasons, the school has recommended him to Social Assistance. The girl, D., hadn't friends, she seemed dumb and expressed only by drawing. During scholastics activities, she seemed passive and uninterested, wrote untidily and hadn't the sense of the space. D. moreover, didn't eat solid foods: her diet only liquid not permitted her to take part to common meals. Also in her family there are five members, her father is always far from the family and one sister of her has the same psychological problems of dumbness.

The complex class's conditions, pushed the teacher to find creative teaching procedures: she selected and personalized cooperative learning procedures, concept mapping and laboratorial didactic.

3   The teaching strategies: cooperative –learning

Since the first month of the school-year, teacher divided pupils into five little cooperative-learning groups. The groups are made of 4 or 5 members chosen by teacher and, in turn, every child plays different roles in the group. So, each child can demonstrate his best abilities but has to test himself in less appreciated activities also, doing his best because he knows that from his performance depends on the success of the whole group. Because of the problems of the class, till now the members of each group are yet the same. Since February 2006, little cooperative groups have begun concept mapping: before, pupils worked on individual scientific concepts (see in the following), on shapes and connecting lines. In the experience below, cooperative –learning groups put in action in the stage of graphical and written formalization.

3.1   *The laboratory of science and the concept mapping*

The scientific laboratory started from the construction of the concepts concerning three key-words of "the Words of the sciences" project: object, material, property. These key-words (or concept - words) are fundamentals to build not only scientific competences but mathematics, logic and linguistic one too: a good understanding of them, allow children to face up to a lot of sensitive and conceptual problems. During the school – year, students have assembled, classified, distributed everyday-objects using the key-words and have collected them in "objects' boxes", one for each group. At the end of every experience, children have formalized in a lot of ways: by speaking, by drawing, by doing learning objects and concept maps by yourself and in group. The early concept maps were made by free-hands drawings inserted in shapes connected each other by arrows, while link-words and concept – words were written by teacher; then, when children began to write and their experiences multiplied, they have begun to use together writing. Nevertheless, because of the different rhythms written abilities' learning, till the end of school year, teacher permitted no-written concept mapping and stimulated the creation of groups' concept maps. The following experience about floating, therefore, is a result of a lot of experiences about objects, property, material and concept mapping that students made previously by alone or in group. During the conversation below and in every scholastic activity too, teacher accepts dialectal words without correcting them to don't inhibit students.

3.2   *The conversation about floating experience*

The teacher takes in classroom a big basin full of water; then, asks to every cooperative - group to bring his own "objects' box".

Teacher: In your opinion, which object in your boxes can float?

R.: (using a slang word) the "cucchiarella"*

Teacher: Why?

M.: It is of wood.

R.: It is light.

R.: It has nothing to do with "light". The boat floats: it is of wood and isn't light.

All: It's true!!

Teacher (showing a key of iron): For you: does this key float or sink?

V.: No, it sinks because is made of iron

S: It doesn't sinks, it float. The ship is of iron too and doesn't sink.

T.: Let's see what happens!

Children put an iron key and a woody spoon in the basin: the woody spoon floats, the iron key sinks.

R.: But how!! Why doesn't sink the iron ship?

O.: Because the waves of the sea hold it up.

G.: No, it isn't true: a day, j have lost a necklace in the sea, it has sunk though there were waves.

S: Why does it happens : they are made of the same "rrobb"*? !!!!

T.: We can test our ideas about floating whit the help of two plastic objects: (taking two objects out a objects' box) this little ball and this handle of spoon. In your opinion, what does it happens?

A.: They are going to sink.

R.: No, they are going to float

T.: Let's experiment!

A pupil puts the two objects in the basin and observes what happens: the little ball sinks, the handle floats.

T.: Why?

A.: Because they have different colours…

R.: It isn't right: also life-rings have different colours but all them sink..

G.: These two objects are different…

T.: What is the difference?

G.: The shape, the shape!!! J know it: j remember when in infantry school j experienced the floating of a ball and a boat of plastic. The ball sank and the boat floated.

R.: J understood: the ball and the handle are both of plastic but have different shapes..

M.: Yes, as the key and the ship that are both made by iron

*cucchiarella: woody spoon

*rrobb: in this context, material

4   The concept maps of the group

After the experience of floating, little cooperative groups have been invited to make concept maps concerning it. The task was to explain floating or not floating of different objects made of the same material, by using the three key-words of the science: material, object, proprieties. The map in figure 1, is the maps of the groups where there were D., that had the task to draw shapes and linking. In lions' group (figure 2) S. had the task to co-ordinate the whole work of the group. The cats' and birds' groups involve each of them a disable child (figure 3 and 4). As can notice, the maps are almost identical because identical were the initial experiences, shared the concepts-word and the meaning of links between them; in addition, it is worth noting the division of tasks allowed also groups which included children in very difficult circumstances, to take a good quality result.
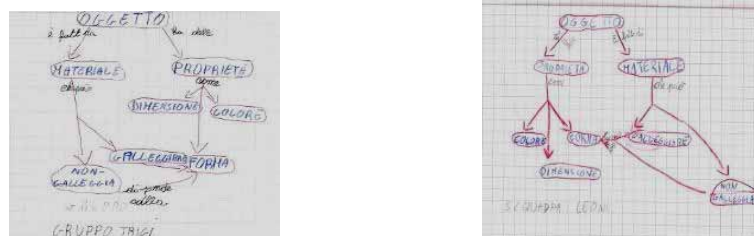

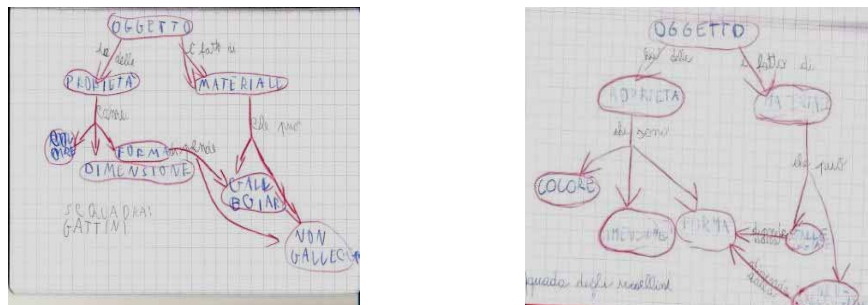**Fig. 1-2** : concept maps of tigers' and lions' groups

Fig. 3 -4: concept maps of cats' and birds' groups

Translate: Oggetto: object; Materiale: material; Proprietà: properties; Dimensioni: dimension; Colore: color; Forma: shape; Come: as; E' fatta da: is made ; ha delle: has ; dipende dalla : depends on; che può: can; Galleggiare: to float; non galleggiare: doesn't float.

5 End

At the end of school - year, we noticed important improvements in the three initial groups: during scholastic year, children that had scarce bodily intelligence have been involved in a lot of physical activities and, during end school-year show, they have even danced. The children of the second group have acquired a richer and complex language and, today, they are able to produce by yourself written concept maps on known matters. Their social behaviour is more acceptable too. Also the children of the third group have a better social behaviour; know a lot of new national concepts- words e linking - words based on shared experiences. All can read and write easy propositions, can operate whit numbers to resolve easy mathematical problems, can understand scientific problems. For two children of the third group, nevertheless, further medical investigations required by teachers, has revealed serious physical and psychological troubles. As for S. and D., a regular and difficult work of relationship and teaching whit both children and their families, has allowed to attain good results: today, the first refuses yet to write on his copy-book (he likes only to write on blackboard) , needs continually teacher's encouragements but his logical , mathematical and scientific intelligence is very remarkable. Also his social and linguistic behaviour improved: today, he doesn't get away the classroom, controls better his anger , plays with his friends and loves his teachers. D. eats solid foods, writes fluently, she talks (yet quietly and seldom) with classmates and teachers; even, she played a little role in the final school – year' show. In conclusion, we can assert that the simultaneous use of different teaching strategies and the individualization of teaching, allow to aim a meaningful, collaborative and shared learning to all children and make possible to gather in the scholastic activities difficult students also: in fact, they foster meaningful learning based on real problems, on significant experiences and on groups in which the task distribution allows to involve every kind of intelligence. Ultimately: on the scholastic and human successes , are set children in very difficult circumstances' hopes to improve their future.

6 References

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