

## CONCEPT MAPS AND TRAINING OF CHILDREN HAVING SPECIFIC LEARNING DISORDERS

*Patrizia Venditti, Emanuela Viara  
I.C. Borgo San Giuseppe, Cuneo, Italy  
Email: patriziavenditti18@libero.it*

**Abstract.** The experience reported in this article was conducted in a Second Class of primary school where concept mapping has been applied as an instrument of educational work. Thanks to the exchange of knowledge and experiences between the class teacher, specialized in the identification and treatment of specific learning disorders and the school manager, experienced in educational research on concept mapping, the pupils have been involved in the creation of concept maps in their school work. The introduction of the concept mapping has been greatly facilitated by the active methodology and plurality of languages currently used by the teacher since the beginning of primary school because of the presence, in the class, of four students affected by dyslexia. So far, the maps were used in the process of strengthening and assessment of learning, related to a wide path of work started since the kindergarten, but its use is expected to be continued during the investigation of prior knowledge and progress tests. This is because, although in a limited period of time, the introduction of concept maps has enabled all pupils-including those with specific learning problems, to achieve visibly better outcomes than previously. This is a further confirmation that concept mapping is an indispensable tool for educational success even with children with specific learning disabilities. The teaching experience that is illustrated below is part of a wider process aimed at making the child acquire the concept of linear or historical time. This route started from the concept of cyclical time (day-night alternation, days of the week, months of the year, seasons) and, during the first three years of primary school, bring pupils to awareness of the time line. For the current school year, we will stop at the alternation of the seasons.

### 1 The specific learning disabilities in the classroom

In the second class of primary school of Madonna delle Grazie, where the experience that follows was conducted, there are 4 students with specific learning disorders (in english: Learning disorders –LD). More specifically, reading the diagnosis, we know the following informations: in pupil SB are observed critical performances in: 1) reading -both the parameters of accuracy and of speed, 2) correct spelling abilities, with the presence of numerous errors. Another student, L.B., encounters grapho-motor difficulties related to spatial and motor skills. The student S.F. presents a rather complex situation, where strong dysorthography and dysgraphia are associated with disorders of behavior, attention and difficulties in social interaction. The diagnosis shows an I. Q. (intellective quote ) higher than the standard. The last case, M.M., presents a regular I.Q., difficulties in automation of the reading-writing skills, numerous misspellings and stunted in reading. The pupil also has, in mathematics, difficulty in written calculating. Now, we see more in detail what the specific learning disorders are. The most modern definition is "a specific learning disability of neurobiological origin. In particular, dyslexia is characterized by difficulty in making an accurate and / or fluent reading and poor writing skills and decoding. These difficulties typically result from a deficit in the phonological component of language ... Secondary consequences may include problems in reading comprehension and reduced reading practice, which can inhibit growth of vocabulary and general knowledge "(1). The study of learning disorders has attracted growing attention in recent years. Many researchers in the field, through various contributions, have shown that they are not a result of emotional or psychological trauma, but the expression of a particular neuropsychological failure without involvement of cognition in general. In fact, to arrive at a diagnosis of LD - which usually is not made earlier than the age of 7 - it is necessary that the subject has a normal Q. I.

The specific problem of learning may involve specific functions such as reading (dyslexia), writing (dysgraphia - dysorthography), calculation (dyscalculia), or engage learning processes in general. According to studies conducted in Italy by Dr. Stella about the LD, it is important to remember that:

- The specific learning disabilities are congenital in nature and tend to occur in clusters rather than in isolation, especially in the early years of schooling.
- The LD tend to persist over time because it is the functional consequence of neurophysiological or neurochemical architecture.
- In the story of some children with LD there is a language disorder already present at the time of kindergarten.
- The verbal language is affected by disorders of some brain areas.
- During the development of disorders such associations tend to become weaker and the profiles that emerge are characterized by the presence of a disorder in one of the most pronounced impaired abilities (reading, writing and arithmetic).

The presence of LD students in a class require that teachers find, from the beginning of elementary school, a variety of learning strategies to involve the different intelligences and a lot of instructional instruments to get

over the linear logic of the book. In fact, the main objective of teachers that deal with LD pupils is to find tools to facilitate and give them autonomy in the learning process. Nowadays, an important help comes from computers especially from the softwares that help to build concept maps. Cmap tools not only allow to organize in a reticular way the content of study but gives a lot of opportunities to include iconic, audio, video resources in a simplified syntactical structure that maintain all his complexity.

## 2 The work process: step 1. Guided conversation

To introduce the topic of seasonal changes, the teacher leads the children in the garden next to the school and invites them to observe trees and shrubs around them. The children themselves, after the visit, note that the birch trees and some flowering plants have more leaves, the branches are bare or colored in shades ranging from brown to white - the branches and trunks are clearly visible. The teacher then asks: "What are the seasons, in your opinion?"

S.F. "It 's time that goes forward"

S.B. "They are spring, summer, autumn and winter"

G.C. "It 's time that never ends"

LB: "It 's time that changes: it's cold, it's hot ..."

NR: "The days are short in winter, in summer there is plenty of sunshine"

Concluded the round of intervention, the teacher incorporates the observation of SF and G.C. and asks: "How is it possible that the time goes on but it never ends?"

SF: "But yes, it is always the morning after the afternoon then the evening, then night, the morning .. just like a circle"

T.C. "It 's true that everything repeats itself, however, we grow"

GB: "Plants are grown in the garden from last year. Even my canaries have grown: they were first in the egg and now they are flying "

N.R. "My brother last year was in the cradle and now he walks"

S.F. "So the time is always the same: it's like a circle that repeats itself. But people, trees, animals change "

MM: "Even the objects change: at the beginning of the school year my pencils were long and now they are short because they have been sharpened."

At this step the teacher proposes a simple reflection: living beings are born, grow, reproduce and die in the time that repeats always the same, just like a circle that never ends.

## 3 The plurality of languages: the dance, the experiment, the drawing

To facilitate understanding of the concept of cyclic and linear time, the teacher offers a variety of activities: presentation of images to order in correct sequences, nursery rhymes, readings that contain more specific terms such as day, night, sunrise, sunset, and a simple scientific experience with the use of a torch and a globe (Fig.1). Here, the children get very excited discovering that the sun is stationary (torch) and the Earth rotates on itself (day / night), on its own axis (seasons) and around the sun (year). To deepen the understanding, the teacher asks the children to represent the movements of the earth in different ways: through their body (Fig. 2), through free drawing and through the completion of the wheels of time.



Figure 1: Experience with the use of a torch and a globe.



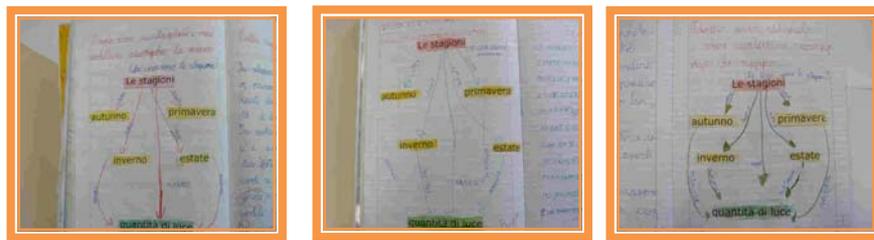
**Figure 2:** To deepen the understanding of pupils through the body (movement intelligence).

#### 4 The concept mapping and cognitive performance of LD affected pupils

At this stage, the children are in possession of a range of information and concepts that can be formalized in a group concept map. First, the teacher explains what a concept map is and how to build it: concept-words are restricted to rectangles or ovals and linking-words are written on relationship-oriented arrows, to link two or more concept-words. The children initially choose the words to be included in the map, then build cardboard rectangles and arrows. They play all together to build the pattern of the map by changing the order of the rectangles and arrows until they get to a map shared by all. On one wall of the classroom is attached a very large sheet of paper where they can finally stick the map of all (Fig. 3). The next day, the children are invited to construct an individual map, each on its own notebook (Fig. 4) and "tell" the process in a written text (fig. 5). In the transformation of the concept map into a text, even children with SLD achieve excellent results: in their text there are no mistakes. Comparing this result with that of only a few weeks before, it's a real miracle!



**Figure 3:** The map of seasons is finally ready !!! (stagioni: seasons sono: are; Primavera:spring estate: summer inverno: winter Autunno: fall hanno: have quantità di luce: amount of light Maggiore: most minore :less).



**Figure 4:** Individual maps of children LD affected.



**Figure 5:** Linear text made by children LD affected after concept mapping activities compared with others text made by them (the mistakes are circled in red).

## 5 Conclusion

A lot of studies, particularly in English language countries, put in evidence that nowadays the prisons are full of men and women with LD whose frustration and rage at the age of school change in behavior disorders. So, it's time that schools all over the world make a serious exam of their social mission and consider the way to become places of human promotion, where everyone find the way to express his own aptitudes and avoid the risk to be places whose main aim is to maintain the status quo. It's essential to develop a new, more modern and humane model of school where every child, every teen ager is enabled to find his own way to express is capabilities and improve them. The first step to improve schools is to stop using the same systems that there were 5 centuries ago (a teacher that explains and pupils that listen; a system of teaching, learning and assessment mainly based on linguistic or mathematic intelligence), despite of the progress of technic and society. The use of information technology, especially of a software such as Cmaps, is not only a tool for teaching, it's a way to allow everyone to achieve a meaningful learning. And this is, for SLD children, the main tool to avoid awful consequences.

## 6 References

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