

## USING CONCEPT MAPS TO HELP 3 YEAR OLD CHILDREN TO ADAPT TO THE ENVIRONMENT

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**Abstract.** Piaget (G.C. Davenport, 1994, pp 126-144) believed that intelligence was all about making appropriate adaptations to things around us quickly and efficiently. He stated that babies start making schemas and move on through adaptations, assimilation and accommodations. In order to adapt he said that we need to organize our experiences in some way, as without some mental organization it would be difficult to learn simply from experiences. My task as a teacher/educator is to help children to see, to discover, to understand their close environment and to organize experiences in a meaningful way. In today's society, knowledge and intelligence are fundamental pillars therefore it is highly important for students - even at a very young age - to become experts with the world of knowledge. This work presents an attempt to provide three year old children with a broad view of the relationships and concepts in their surrounding world using concept mapping as a tool and as a mode of independent learning. The results of using concept mapping with the class have proven it to be an effective tool in giving a broad view of the world and to see relationships and inclusivity among concepts. It has helped children to see patterns, make connections and to externalize their ideas in a collaboratively way.

### 1 Introduction

It is characteristic of children in this age group to organize their thinking around basic mental schemas which will eventually develop into more elaborate ones. They understand basic sequencing in a story or process, such as "beginning", "middle" and "end". They are capable of seeing the connection between cause and effect. The idea of belonging to a group or family helps them to make categories. "Same" and "different" are concepts they understand clearly. They are able to solve simple numerical problems. They are always ready to suggest different endings to a situation or story. They will give innumerable solutions to conflicts. These are children who need to express through play and representations. And above all they are highly motivated towards learning in general.

In my school teaching instruction is organized by means of objectives. These objectives are aimed at through contents, processes and attitudes. Contents are concepts, ideas to be taught. These concepts are grouped under an umbrella of topics: The Family, The School, The Body, The Seasons, Farm Animals, Transportation etc., all part of the child's close environment. The different skills are developed through mental and physical processes. Positive attitude towards learning is encouraged constantly and the children slowly and steadily work to meet the objectives.

The methodology used in the school allows the child to develop physically, socially, emotionally and intellectually. Using different resources/materials and making a good use of Information and Communication Technologies devices the child is provided with the appropriate tools to develop cognitively and emotionally. Some of the cognitive tasks used in the classroom are: pondering, classifying, collecting, comparing, contrasting, describing, discovering, identifying, predicting. Association techniques connect ideas with lines or even circles are used for this purpose. Activities implying numeric sequences are also used but these children have never been exposed to concept mapping before.

The important challenge was to create the right conditions for learning to take place. This was accomplished by showing the children a tool which could help them to see and understand the world around them, to recognise and depict relationships among concepts, and to recognise the hierarchy which supported the structure. The aim was to show them the whole picture in a snapshot. The Instrument: The Concept Map.

The research project was started with a Vee diagram, (Gowin, 1981), Figure 1.

### 2 Methodology: approach to the map

The subjects selected were sixteen children between the ages of three to four. All had started school in 2007; receiving six instructional sessions every day. I considered taking some of these sessions to achieve my final goal. Lessons and strategies were carefully planned, all the stages scaffolded, and time spent for each activity was taken into account plus resources and materials. It was necessary to be aware of all the skills and cognitive tasks with which the children would be involved.

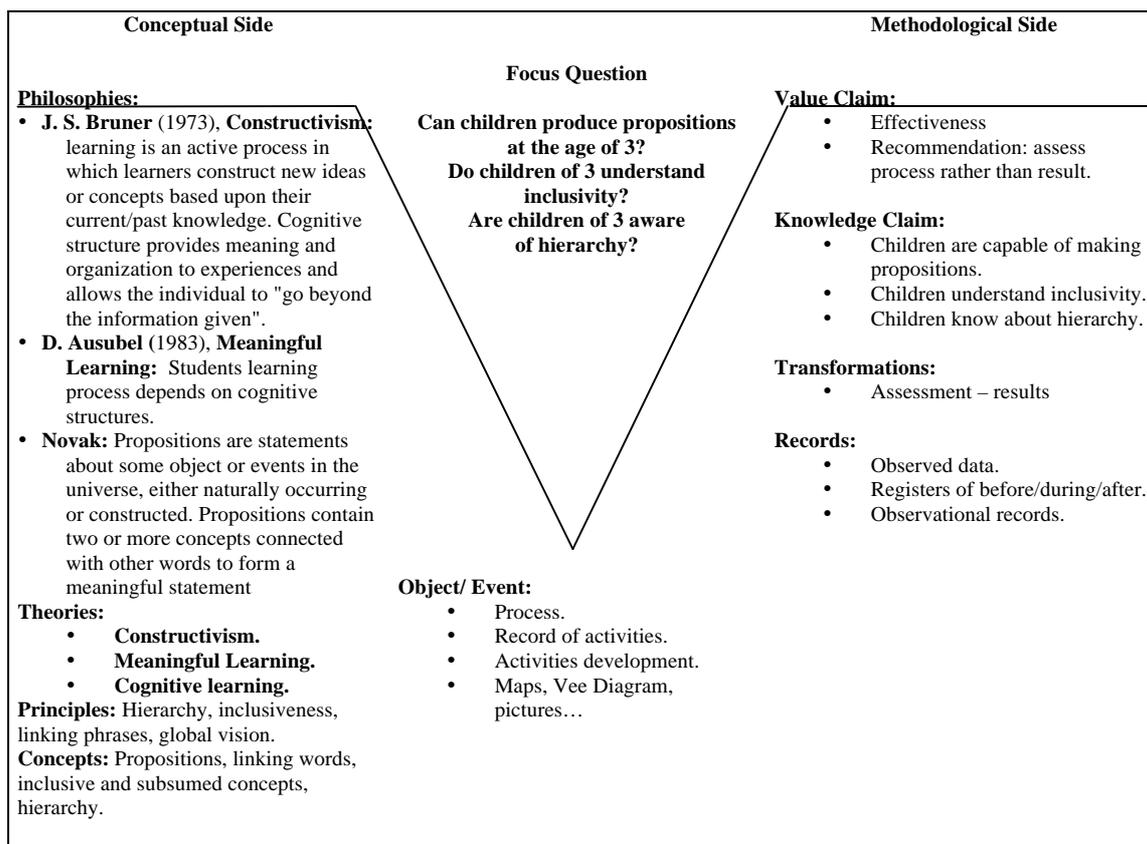


Figure 1. The Vee Diagram showing the research project.

## 2.1 Step 1

Firstly it was necessary to discover whether the children knew the vocabulary related to all the concepts taught in the classroom. Deloache, Uttal e Pierroutsakos (1998), discuss the symbolic meaning of objects rather than focus on the object itself. With this concept in mind and activity was created where the students had to picture-read flashcards, naming all the concepts seen so far in our lessons. Te children had no difficulty reading all the cards presented.

## 2.2 Step 2

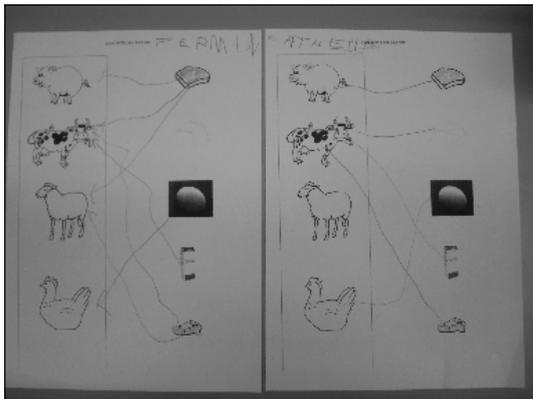
In the next activity the idea of *inclusivity* was checked, knowing that a more inclusive concept is one that, according to the learning task in progress, can be considered a superordinate concept. The children were presented with a pack of flashcards containing: members of a family, some farm animals and some pictures of rooms in a house. The instruction for the task was to group the cards in three piles. The students quickly grouped the pictures as shown in Figure 2. When asked their reasoning for their grouping, they produced some interesting responses: “*It is a family*”; “*all animals live on the farm*”; “*we see this in a house*”. The Family, Farm Animals, The House; were the responses in which the children were showing their understanding of inclusion and hierarchy. They knew there was a superordinate level or concept from a hierarchical perspective. Randomly more flashcards were shown with images such as “*an apple*”, “*some garments*”. To my amazement the students started showing some recognition of the relationship among some of these concepts seen on the cards. They were producing sentences like: “*Mummy wears a hat when it is cold*”, or “*we eat tomatoes*”, or “*I have a dog*”. All along they were making propositions, i.e. sentences containing two or more concepts connected using linking words or phrases to form a meaningful statement. The propositions are the element that makes concept maps different from other similar graphic organizers.



**Figure 2.** Children's first relationships

### 2.3 Step 3

By this stage all three focus questions had been answered. The students were showing the cognitive skills involved in Dr. Novak's concept maps. It was then that the idea of arrows was introduced to make connections and show directionality. An activity was prepared where the children had to join with arrows products with their corresponding animals using arrows. A worksheet with two columns was designed. See Figure 3. On one side were the animals and on the other side the products. Children quickly understood the task but the idea of using arrows instead of a line took a while to grasp. Different activities had to be designed to show clearly their understanding of directionality. See Figure 4.



**Figure 4.** Activity showing directionality.



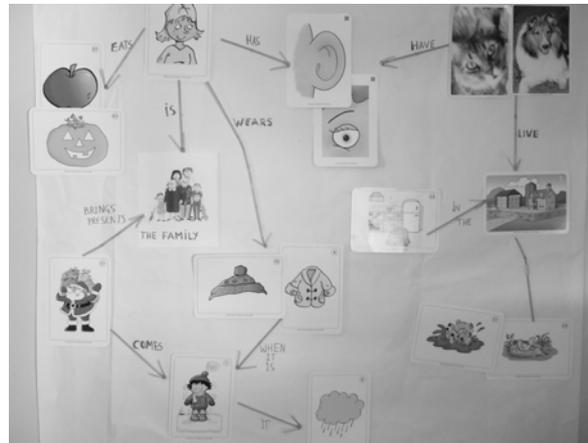
**Figure 3.** Activity showing inclusion.

### 2.4 Step 4

Knowing children were able to: see the relationships among concepts, understood inclusivity, were able to produce propositions and they understood directionality it was time for our first attempt to do a map. In the morning session the idea of maps was discussed, different types of maps were shown to the children and we talked about their use. *"With maps we can find where things are. We can find where the house is, we can see roads, names, little pictures of buildings"*. The children were taught that maps could be used for different purposes and that they were going to be shown how to do these. Like a real map, their map was going to have roads and labels and pictures were going to be included.

I prepared a huge piece of white paper along with some arrows made of straws and the flash cards which had been used consistently. A group of only four children were trained to concentrate better on the task but before the session was over some other children had joined in and were also making suggestions. This was a magical moment as the different children were seeing different relationships among the concepts and the arrows were pointing in different directions. They were learning from each other. My instructions were clear and concise, I would flip the cards and they would have to tell me where to place them and how to connect them with the arrows. The first card to appear was the cat, and everyone agreed it had to go on a corner of the paper. The second card was the picture of a mother and it was placed on the opposite corner. The third card was a picture showing an ear, the children decided to put it in between the mother and the cat with arrows point both ways as

mothers and cats have ears. The map was forming and little by little the children were not only placing the cards and placing the arrows they were debating their arguments and their reasoning for their decisions. When the picture of Father Christmas appeared there were two different responses. Some children decided it had to be linked with the cold weather, but another child said it had to be connected with the family, their reasoning being that “*Father Christmas comes when it is cold*” and “*Father Christmas brings toys to the children in the family*”. So arrows were placed pointing in quite different directions, towards the family and towards the flashcard that represented cold weather. See Figure 5.



**Figure 5.** Children’s map

Little by little and through guided questions the children constructed the map, they watched carefully how connections were made and they saw the linking words used to connect the concepts.

### 3 Summary

This research project has shown evidence of children’s ability to understand the concept of inclusion, hierarchy and their ability to make propositions. Therefore I see concept maps as a useful instructional tool even in preschool education. The concept map has also proven to be a valuable assessment instrument, while the children were organizing the map they were showing their understanding of the concepts learnt throughout the school year. The collaborative work and the way the children externalized their ideas was another positive aspect of using concept maps, so further research will take place to look into the many possibilities of concept mapping and its use in preschool settings.

### 4 Acknowledgement

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