

More flexible ways of using concept maps in classrooms

Notes for Teachers

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What Novak and Cañas say about concepts and propositions

First I will remind you about how Novak and Cañas describe concepts and propositions that I talked about in the first section of my talk. You can study them more deeply because the latest introduction and instructions of the Novakian types of concept maps are published as a technical report on the web by Novak and Cañas (2006, 1). Their explanation of concept maps is:

Concept maps are graphical tools for organizing and representing knowledge. They include concepts, usually enclosed in circles or boxes of some type, and relationships between concepts indicated by a connecting line linking two concepts. Words on the line, referred to as linking words or linking phrases, specify the relationship between the two concepts. The result of linking two concepts is a proposition Propositions are statements about some object or event Propositions contain two or more concepts connected using linking words or phrases to form a meaningful statement.“

I think that it is important to add here that it is very important to use a verb phrase, in order to create claim about the real or imagined world. These claims are called propositions. Novak and Cañas go on to say(2006, 1):

Another characteristic of concept maps is that the concepts are represented in a hierarchical fashion with the most inclusive, most general concepts at the top of the map and the more specific, less general concepts arranged hierarchically below. The hierarchical structure for a particular domain of knowledge also depends on the context in which that knowledge is being applied or considered.

There is no flexibility in this approach. Although it can be effective in teaching science and maths concepts for example, I have developed these ideas of Novak and Cañas to present another approach to concept mapping (Åhlberg 1993 and 2004) as general as language itself. This can be used on contexts where structured mapping is not appropriate.

The Åhlberg approach

Everything that humans are able to express by speaking, can also be written. Everything that can be written can be transformed into concept maps. If these concept maps are good enough, they can be transformed accurately back to ordinary texts (writing) and/or speaking. Any learning theory is compatible with improved concept mapping, because it is as general as language itself. Actually improved concept mapping can be used from individual knowledge building/construction to social knowledge building/construction from teams to humankind. Internet finally allows all humankind to learn. It connects all nations, and most key persons. Software like CmapTools is has been designed to create and share concept maps, and for collaborative knowledge building by publishing concept maps as web pages.

It is true that hierarchies are often the most natural way of presenting human knowledge. On the other hand, according to modern science, the World is a system. This idea can be tested by a thought experiment: Everything in the universe is in some way connected to everything else. If it is not connected, then humankind would have no chance to learn about it. Accordingly what is not connected cannot be part of our universe. This means that just connecting concepts (or key words) is not very interesting, because in the

universe everything is somehow connected. The point for learning is more how concepts are linked to each other in our thinking. My development of concept mapping reveals this approach.

Elements of an new method of concept mapping

Below I present only five points from a list of ten that I have researched that allow for conceptual linking in the mind (for the full list see Åhlberg 2004). There are some significant differences between this approach and the Novakian designs.

A new design system : five rules.

- 1) All concepts are interpreted as main elements of thinking and learning, and they are always inside frames. In Novak and Gowin (1984, pp.14, 22, 52) and Novak (1998, p. 100) concepts are sometimes inside frames and sometimes not.
- 2) Novak and Gowin (1984) and Novak (1998) prefer very short verb-based labels for concepts. However, concepts sometimes require many words in order to be correctly labelled. There is no accurate limit on how many words may be included in a concept label. any number of words can be used to name the concept accurately.
- 3) In order to have a meaningful proposition in CmapTools all links between concepts have arrowheads to show the direction in which the connection from one concept to another is to be read. In contrast, the rules of Novakian concept mapping are that only concepts that are either horizontal or are to be read upwards should have an arrowhead (in Novak and Gowin (1984) and Novak (1998)). However, this complex rule is not always remembered even by those who use the traditional Novakian concept mapping model (e.g., Novak & Gowin, 1984, p. 176; Novak, 1998, pp. 52, 84,121). For example, Novak and Gowin (1984, p. 102) presented a concept map in which all the links had arrowheads, and they called it “a good concept map.” I agree, it is a better than the earlier more restricted concept map.
- 4) The labelling connected to links may be short or long, but it must accurately express the thinking of the person whose thoughts are being mapped. Novak and Gowin (1984) and Novak (1998) favour very short verb or verb-phrase expressions. However, from my point of view, the essential point is that the labelling for the link should include a verb and that the truth-value of the resulting proposition can be established.
- 5) In my system you can connect pictures, videos, sounds, et cetera to concept maps (e.g., Åhlberg, 1993). So far Novak and Gowin (1984) and Novak (1998) have not written about this aspect of mapping. However the use of computers by all the researchers has increased the value of the maps for both individual and collaborative knowledge building. The maps are an important tool for strengthening important thinking skills to help us survive in the emerging global knowledge society.

You will find the papers that I have quoted in this bibliography of books about mapping. Some of these are available free online.

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