Concept mapping – a reflective tool in Personal Development Planning

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Introduction

Concept mapping (CM) is a research and teaching tool which helps reveal learners' knowledge of a particular topic and has been used to capture students' representations of particular subjects, diagnose the gaps in knowledge, follow progression and measure the impact of specific interventions introduced (see Hay 2007, 2008; Hay & Kinchin, 2006, 2008; Kinchin & Hay, 2005; Kinchin, Cabot & Hay, 2008; Kinchin, Lygo-Baker & Hay, 2008; Jankowska, 2009, 2010). But it can also be a powerful reflective tool used for personal development planning (PDP) purposes, which makes the process of exposing personal development ideas explicit. In this article I would like to concentrate on a discussion of the usability of CM as a reflective vehicle for students in the context of PDP.

According to Novak (1998), Hay (2007, 2008) and others, concept maps have the value of 'making learning visible' as the teacher can actually 'see' what ideas the student has about a particular topic and can evaluate students' learning and acquisition of crucial concepts (threshold concepts in Meyer & Land's language, 2006). Novak (Novak, 1998; Novak & Canas, 2006) believes that the visual representation of the knowledge in the form of a concept map promotes the integration of new material with existing cognitive structures and in that way contributes to meaningful learning.

Novak (1998) states that the individual can learn meaningfully if the following conditions are met:

1. The learner's relevant prior knowledge: the learner must know some information that relates to the new information to be learned (it is important to assess learners' prior knowledge)

2. Meaningful material: the information to be learned must be relevant to other knowledge and must contain significant concepts and propositions

3. The learner's motivation to learn meaningfully: the learner must consciously and deliberately choose to relate new knowledge to knowledge s/he already knows in some non-trivial way.

Based on the above conditions Novak proposed the following typology of learning (the points below correspond to the idea that a concept map should be done repetitively to reveal the outcomes of learning):

• Non-learning: the lack of cognitive change (manifesting as a lack of new concepts in a following map and an absence of new links in the student's prior knowledge)

• Rote learning: the addition of some new knowledge but with the absence of links between new and previously learned material (indicates lack of deeper understanding and assimilation of the new knowledge)

• Meaningful learning: a significant change in the structure of knowledge (manifested either by the addition of new concepts and/or links in the prior knowledge structure developed during learning, or the meaningful linkage of new concepts to prior knowledge).

The typology of learning corresponds with the basic structural typology of chains (non-learning), spokes (rote learning) and nets (meaningful learning) to describe the most commonly encountered concept map structures:

- Chain: a linear structure in which each concept is only linked to those immediately above and below in a logical sequence. There is no scope for further additions other than at the bottom of the structure. Any deletions disrupt the overall structure and there is little possibility of richer linkage

- Spoke: a single-levelled radial structure in which all the related aspects of the topic are linked directly to the core concept, but are not directly linked to each other. It is often quite simple but allows for further additions to the structure and any deletions do not interfere with the overall structure

- Network: a highly integrated and hierarchical structure, often with several levels, which demonstrate a deeper understanding of the topic. Any additions or deletions are possible with various influences on the overall structure and scope for further development (see the example below).

What is a concept map and what does it look like?

A concept map:

- is a way of organising and representing knowledge in the form of a diagram showing the relationships between concepts

- reveals concepts, usually represented as boxes or circles, which are connected with labelled arrows in a hierarchical structure

- has arrows labelled with short phrases such as 'is', 'leads to', 'gives rise to', 'results in', 'is required by', or 'contributes to', etc.

The fact that the concepts are linked with labelled arrows is a distinctive feature which does not appear in other kinds of mind maps, but is an important step towards achieving fuller understanding of the knowledge that is available to a learner at a particular moment in time. The student can hold both valid and invalid ideas (misconceptions) about a given subject and concept maps can be useful in revealing the incorrect assumptions, which then can be changed. Unless the learner is aware of the mistake s/he cannot correct it. In order to investigate the learning in more detail it is important to show the concept maps made before and after the learning has taken place. This would make the changes in learning structures and the progress (or, unlikely but theoretically possible, regression or stagnation) in the students' knowledge of the subject, more transparent.

A detailed discussion on the CM process and its outcomes can be found in Jankowska (2009, 2010). However, it is important to note that various teachers and researchers use CM to capture students' knowledge at a particular point in a learning process and then use the outcomes as a basis for further work on the subject matter.

The example below is a map created by a group of PDP practitioners at the University of Bedfordshire on the subject of PDP (Jankowska, unpublished PhD data).

Figure 1: PDP map from the University of Bedfordshire

How can concept mapping be used in supporting PDP?

In my PhD research (Jankowska, 2009, 2010, unpublished data), I explored the use of CM technique in a much 'softer' area of PDP, not related to any particular subjects where CM has been traditionally used, such as science, medicine, accountancy, etc. The challenges and opportunities of using CM as a research tool as well as a critique of available approaches have been discussed elsewhere (Jankowska, 2009). Here, I highlight the usability of CM as a reflective tool for students in the context of PDP.

The task of CM can be useful, engaging and rewarding for the students, especially when the topic is related to their personal experiences. My research on personal development indicated that the task of concept mapping was a valuable experience which gave students an opportunity to stop and reflect over the things they rarely explicitly focus on and verbalise in their everyday life, such as their personal development, learning and future. Many students expressed the feeling of being so immensely submerged in the task that they forgot about the time and surrounding environment (which Csíkszentmihályi (2000) refers to as the state of 'flow'). In the light of a growing literature indicating the difficulties of reflection and the development of meta-cognitive skills (e.g. Clegg, 2004; Clegg & Bradley, 2006; Tomlinson, 1999; Bleakley, 2000; Eraut, 2000), there is more argument in favour of structuring reflection so that students actually know how and on what they should reflect. Many of the students with whom I worked expressed their confusion about reflection. In one participant's words:

"So it's really hard to reflect …. OK, they say: reflect on your learning and understanding but … of, of what? Of what I've learned? Or what I gained for my future? Or how I learned it? Or should I say what will I do in the future? … I don't know! I would like to learn how can I improve my skills but I don't know what are the tools to do it."

(S3, 2007)

The task of CM seems to offer an opportunity for the student to get involved with the structured reflection. Whatever the subject of reflection might be, when sketching a concept map the learner needs to draw on all the concepts that are available to him/her at this particular point in time and make some connections between the ideas in order to create a map of his/her current understanding. I encouraged my students to use small Post-it® notes for the concepts, which

would allow re-structuring of the map by shifting the concepts around. This proved to be useful and invited further reflection on where particular concepts fitted and how they related to other concepts in the student's vision of personal development. Ideally the task of concept mapping should be followed with a discussion (either in a group, with a tutor, as a presentation or in a written reflective essay) where the student would have an opportunity to explain the ideas and therefore engage in further meaning-making by working through the subject. If CM is repeated over time (e.g. at the beginning and end of an academic year or a module) the process of working out the knowledge can be made visible. Moreover, CM can be used as a diagnostic tool to locate the gaps or misconceptions in the student's understanding, which can then be addressed during the course of study and evaluated again at the end of the process, allowing for cyclical reflection.

Conclusions

PDP by its nature should be cyclical and involve learning, doing, recording and reflection (Higher Education Academy, 2009). Therefore CM that involves both reflection and recording of its outcomes (which can also be used for future tasks related to the topic) can be a useful and engaging PDP tool.

I argue that CM can be useful in PDP as it helps students focus on their PDP, elicit the concepts that are currently of importance and begin reflecting on various aspects of personal development (for example focusing on what concepts are missing from students' maps and why, what needs to be developed, which goals are most important and how to work on them, etc). In my further work I propose a socially mediated structured tool for reflection in PDP (Jankowska, 2010).

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