Chapter 11
Collaborative Learning by Developing (LbD) Using Concept Maps and Vee Diagrams

Päivi Immonen-Orpana
Laurea University of Applied Sciences, Finland

Mauri Åhlberg
University of Helsinki, Finland

ABSTRACT

Collaborative Learning by Developing (LbD) was researched in a University course. The focus was reflective metacognitive competence development (Appendix 1.) of Physiotherapy students. The authors used both individual and collaborative concept mapping and improved Vee heuristics in learning process evaluation. The content of the design experiment was 'Coping at Home'. As educational research it was a design experiment, a multi-case, multi-method study. The core concept of the study unit and development project was 'successful aging'. Both Cmap Recorder and videotaping of discussions during group concept mapping were used. The main result was that plenty of face-to-face dialogue was needed before the shared understanding and group concept maps were created. First the main concepts were fixed and then other concepts and their relationships were elaborated. Differences between individuals and two groups are analysed. In the collaborative learning process, the feeling in both groups was as if they had a unified and shared thinking process. Students continued each others talking and thinking very fluently like they had had "common brains".

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INTRODUCTION

The purpose of the study is to research on Collaborative Learning by Developing in university course of physiotherapy students. We focused on students' ability to evaluate their own learning and competence and formulate a personal development plan; to identify development challenges and problems; to develop their competence independently and with others, and to share what they have learnt in a work community; to assume a role in a group/team and acquire and analyse knowledge systematically. Learning by Developing (LbD) is developed in Laurea University of Applied Sciences, Finland. It is a teaching and learning method. We focus on meaningful conceptual change. Physiotherapy students' learning is monitored and evaluated by the concept maps and improved Vee heuristics. The following aspects are researched: (1) individual conceptual changes and (2) collaborative learning of two student groups.

BACKGROUND

Learning as Conceptual Change and Collaborative Learning

According to Pintrich & Sinatra (2003, p. 6) intentional conceptual learning is goal-directed. The goal is to change conceptual understanding. Intentional conceptual change is characterized by conscious initiation and regulation of cognitive, metacognitive and motivational processes to bring about a change in knowledge. According to Vosniadou & Kollias (2003, 2) the conceptual change is the outcome of a complex cognitive as well social process. Studies of conceptual change have shown that this is a slow and gradual process.

Collaborative learning is used in this report in the sense of Adey & al. (2007, 93): Collaborative learning means that learners learn to listen to another, to argue and to justify, and become accustomed to change their positions. Laurillard (2002) calls for learning technologies and discourse to promote collaborative learning.

Concept Mapping as a Method to Monitor and Promote Learning, Thinking and Acting

In this study concept mapping is used to represent the conceptual understanding and change of it. According to Novak & Cañas (2008) 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. They define concept as a perceived regularity in events or objects, or records of events or objects, designated by a label. The label for most concepts is a word, although sometimes they use symbols such as + or %, and sometimes more than one word is used. Propositions are statements about some object or event in the universe, either naturally occurring or constructed. Propositions contain two or more concepts connected using linking words or phrases to form a meaningful statement. Sometimes these are called semantic units, or units of meaning. (Novak & Cañas 2008, 1)

Åhlberg (1993 – 2005) regards concept mapping as a research method to monitor and promote high quality learning, thinking and acting. Åhlberg (1993) defines concept as a basic element or unit of thinking. Concept becomes accurate only in relation to other concepts, as a part of theory. Importance or centrality of a concept can be estimated from a concept map, by counting the number of links connecting a concept to other concepts. The more links a concept has with other concepts the more important it is in that concept map. If you would take the highest linked concept away from