Chapter 10
Intersubjective Meaning-Making in Dyads using Object-Typed Concept Mapping

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ABSTRACT

In this chapter, we investigate, with an intersubjective epistemology approach, how a concept mapping software tool that integrates a typology of knowledge objects (nodes) and a typology of links mediates the process of meaning-making and of meaning-negotiation of a dyad of adult learners engaged in a collaborative concept mapping activity, more specifically in the context of a text comprehension task. This case study shows that the tool and its object-typed concept mapping language induce certain types of epistemic actions as well as the formation of diverse representational rules by participants, which were jointly and progressively elaborated by them in an intensive effort to share meaning.

INTRODUCTION

Combining the advantages of the learning strategy of concept mapping[1] (CM) with those of collaborative learning, collaborative concept mapping (CCM) has become a topic of interest for an increasing number of researchers in the field of education (Basque & Lavoie, 2006; Gao, Shen, Losh, & Turner, 2007; Kim, Yang, & I-Chun, 2005; Nesbit & Adesope, 2006).

A close examination of the methodologies of 39 studies reported in our own review of research in this field (Basque & Lavoie, 2006), along with over 20 additional studies reviewed since then, made it possible to pinpoint many differences in the structure of the CCM tasks proposed to learners by researchers. For instance, a list of concepts and/or links may be provided to subjects; links may be labelled or not; links may be arrowed or not; roles may be given by researchers to each member of the CCM group, communication constraints may be imposed, etc. Also, CM software tools, such as *Inspiration*, *CMapTools*, or others (some of them still being R&D products), are becoming increasingly popular. Actually, a total of 43 of the 65 studies that we investigated so far provided students with a

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CM software tool, either in a face-to-face context (21 studies) or at a distance (24 studies[2]). In this chapter, we argue that the CM tool and the CM method used in CCM activities can significantly affect the processes of meaning-making and that of meaning-negotiation amongst learners and, consequently, upon learning that may result from such activities.

The idea that CM software are "cognitive tools" (Kommers, Jonassen, & Mayes, 1992; Lajoie & Derry, 1993) or "mindtools" (Jonassen, 2000) to the same extent as databases, microworlds or visualization tools was put forth by Jonassen in the beginnings of the nineties (Jonassen, 1992). Such tools facilitate external representations of information and enhance cognitive functioning (Kommers, Jonassen, & Mayes, 1992; Olson, 1985). This notion of cognitive tool is somewhat similar to the notion of "cognitive artefact" proposed in the field of Human-Machine Interaction by Norman (1991) and by other authors involved in Computer-Supported Collaborative Learning (CSCL) (Suthers, 2006) or working within the Activity Theory framework (Engeström, Miettinen, & Punamäki, 1999). Such a notion acts as a kind of "boundary object" (Star & Griesemer, 1989) for researchers from different fields sharing the idea that external knowledge representation tools guide and influence the learner's activity and, thus, must be considered when investigating potential learning benefits. In the field of CSCL, Suthers (2003) suggested the expression "representational guidance" to refer to the fact that the properties of cognitive tools constrain which knowledge can be expressed in a shared context, and, in making some characteristics of that knowledge more salient, promote certain types of "epistemic actions" to the detriment of others.

In this chapter, we investigate how a CM tool that integrates a typology of knowledge objects and a typology of links mediates the process of meaning-making and of meaning-negotiation of learners engaged in a CCM activity, more specifically in the context of a text comprehension task.

BACKGROUND

We view the CCM activity as a tool-mediated *intersubjective meaning-making activity* (Suthers, 2006). Our approach is based then on what Suthers (2006) calls an "intersubjective epistemology", which differs from an "individual epistemology". In the latter, the individual is the unit and the agent of learning, and collaboration simply provides learning conditions and support. Although it is stimulated by social interactions, the cognitive process remains predominantly individual. In the former, the group is the unit of learning, within which "interpretations can be *jointly created* through interaction in addition to being formed by individuals before they are offered to the group" (Suthers, 2006, p. 317). Intersubjectivity also includes a participatory component: "it is a simultaneous process of mutual constitution that may involve disagreement as well as agreement about shared information" (Suthers, 2006, p. 317) and is comparable to a "polyphonic nonharmonious concert characterized by synchronic movements, as well as by distinct, conflicting and dissonant voices" (Smolka, De Goes, & Pina, 1995, in Suthers, 2006, p. 317).

This intersubjective meaning-making activity is a *tool-mediated activity,* which means that it is situated in a socio-cultural environment where tools and signs are imbricated with actions and thinking that provide them with meaning (Vygotsky, 1978). According to Vygotsky, qualitative transformations induced in the cognitive activity through "psychological tools" or "cultural tools" constitute the main factor of cognitive development and learning in a given socio-historical context.

Our theoretical position thus leads us to suggest that in order to define how a CCM activity can prompt or hinder learning, we must (1) study the communication and collaboration processes which take place among the partners involved in the activity, such processes being closely linked to the joint actions undertaken and (2) consider