Chapter 13
Exploring Semiotic Approaches to Analysing Multidimensional Concept Maps Using Methods that Value Collaboration

Christina J. Preston
University of London, UK

ABSTRACT

This chapter focuses on teachers' multidimensional concept mapping data collected at the beginning and end of a one-year Masters level course about e-learning. A multidimensional concept map (MDCM) defines any concept map that is multimodal, multimedia, multilayered and/or multi-authored. The teachers' personal and professional learning priorities are analysed using two semiotic methods: the first is a traditional analysis of the words used to label the nodes; the second is an innovative analysis method that treats the whole map as a semiotic artefact, in which all the elements, including the words, have equal importance. The findings suggest that these tools offer deep insights into the learning priorities of individuals and groups, especially the affective and motivational factors. The teachers, as co-researchers, also adopted MDCM to underpin collaborative thinking. These research tools can be used in the assessment process to value multimodal literacy and collaborative engagement in new knowledge construction.

INTRODUCTION

This chapter reports on the research, development and modification of tools for the semiotic analysis of hand-drawn, desktop-published and digital concept maps called multidimensional concept maps (MDCM) that will be defined in the first section. These MDCM were collected at the beginning and end of a Continuing Professional Development

(CPD) programme for teachers. The Masters level module was about e-learning, a term that refers to any learning that is electronically mediated using digital technologies. Examples would include a learning episode when information is derived from digital resources online or where the learning discussion is hosted in a virtual learning environment (VLE).

The objective of the chapter is to provide innovative socio-cultural tools for the analysis of MDCMs that provide insights into learners' priorities. These insights are expected both to improve understand-

ing of learning processes for the researcher, the tutor and the map-maker, and to provide emerging multidimensional tools for assessing learning priorities. In particular, the benefits are considered for teachers who are conducting their own research projects with colleagues and pupils.

The chapter covers the meaning of the key terms, concept maps, mind maps and multidimensional concept maps as well as offering a definition of semiotics. The findings from the maps are described and the potential roles for researchers and co-researchers in the map-making process are also explored. The findings consider the value of the tools in identifying collaborative learning and future trends.

DEFINING A MULTIDIMENSIONAL MAP

The terms concept map and mind map are often used interchangeably. In fact, they refer to different methods of mapping and different map-shapes. The term concept map is most often associated with Novak who has worked in this field with other colleagues since the 1980s (Novak and Godwin, 1984; Cañas and Novak, 2007). The Novakian system requires the careful teaching of agreed topics followed by the construction of a prescribed hierarchical map shape by single learners or groups (Figure 1). Ålhberg (2007) is critical of the high levels of prescription and points out some inconsistencies. Nevertheless, in his own work he only reduces the number of rules and clarifies them rather than questioning the prescriptive method.

A different map-shape is promoted by Buzan (2002), called a *mind map*, to refer to maps that radiate from the centre. For Buzan *mind maps* mirror how the mind works. In contrast to Novak he promotes a free mapping exercise where the map-maker provides the content from professional or personal thinking exercises. However, Buzan's belief that these mind maps reflect the ways in

which the brain works is not supported by the limited research into the topic (Anderson-Inman and Ditson 1999).(see Figure 2)

So far, much of the research into mapping has continued to follow this pattern of prescriptive teaching leading towards drawing shapes that are agreed in advance. This study, on the other hand, concentrates on the map-makers' creativity in exploring their own concepts, rather than following instructions from the teacher. This willingness to listen to the learner is a key principle in this alternative approach to mapping associated with the socio-cultural school of semiotics.

Saussure (1916), a founding theorist in this area, defined semiotics as the science of the life of signs in society. Since then semiotics has developed as an all-encompassing term for the study of any kind of sign that is used in a culture to communicate meaning. These signs can be in many different modes including sound, animation, graphics, gaze and gesture. Signs are often, therefore, described as multimodal and the capacity to read them is regarded as multimodal literacy (Jewitt and Kress 2003). Another important aspect of the sociocultural semioticians approach is their explanation of the four communicative strata: discourse; design; production, and dissemination (Kress and Van Leeuwen 2001). These strata emphasis the dynamic set of collaborative processes that result in effective multimodal communication. These strata are not valued in many traditional learning and assessment situations.

The hypothesis in this study was that the teachers might not be as multiliterate as their students. As a result it was not practical, when the study began, to request the teachers to use digital mapping software. The resourcing and training challenges were too great. Pen and paper was the default option. However, during the one-year data collection period the teachers' multimodal literacy improved. Some of the map-makers elected to use desktop publishing. A few used digital mapping packages and one used a sophisticated mapping package linked to the internet that allowed authors

25 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/exploring-semiotic-approaches-analysing-multidimensional/36299

Related Content

Jazz and Jazz Theory
Stuart Smith (2021). *Describing Nature Through Visual Data (pp. 228-309).*
www.irma-international.org/chapter/jazz-and-jazz-theory/259689

Using E-Learning to Achieve Fluency in Foreign Languages
Michael Zockand Stergos Afantenos (2010). *Affective, Interactive and Cognitive Methods for E-Learning Design: Creating an Optimal Education Experience (pp. 187-206).*
www.irma-international.org/chapter/using-learning-achieve-fluency-foreign/40558

Distance Collaboration with Shared Concept Maps
Alfredo Tifiand Antonietta Lombardi (2010). *Handbook of Research on Collaborative Learning Using Concept Mapping (pp. 120-150).*
www.irma-international.org/chapter/distance-collaboration-shared-concept-maps/36293

Adaptive Procedures for Efficient Learning
Slava Kalyuga (2009). *Managing Cognitive Load in Adaptive Multimedia Learning (pp. 272-290).*
www.irma-international.org/chapter/adaptive-procedures-efficient-learning/25741

Adapting Levels of Instructional Support to Optimize Learning Complex Cognitive Skills
Slava Kalyuga (2009). *Managing Cognitive Load in Adaptive Multimedia Learning (pp. 246-271).*
www.irma-international.org/chapter/adapting-levels-instructional-support-optimize/25740