

## Chapter 6

# Factors Influencing Individual Construction of Knowledge in an Online Community of Learning and Inquiry Using Concept Maps

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### ABSTRACT

*This chapter describes a study that used the community of learning and inquiry and concept maps as strategies to facilitate individual construction of knowledge in an asynchronous online course. Six factors influenced the concept map creation, which in turn affected individual construction of knowledge: group characteristics, social presence, cognitive presence, facilitation style of student, discussion summary format, and teacher presence. Working in a collaborative community allowed students to explore different ideas and concepts, but it was through the individual concept map work that students refined and expanded their knowledge and constructed personal meaning. The chapter concludes with strategies to facilitate individual learning in a collaborative online environment.*

### INTRODUCTION

As collaborative learning becomes more prevalent in asynchronous online learning environments, the

use of communities of learning and inquiry that integrate cognitive, social, and teaching presence as the main strategy for the learning experience would be explored and used by instructors in higher education. Garrison (2003) posits that the goal of the community of learning and inquiry strategy is to

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foster “independent thinking in an inter-dependent collaborative community of inquiry” (p. 49). These communities of learning and inquiry have the potential to create an environment for learners to be part of meaningful social and cognitive experiences and gain higher-order learning.

However, when students work in these communities of learning and inquiry in an asynchronous online environment, it can be challenging to foresee the individual learning outcome if the process of learning focuses primarily on the experience of the community as a whole. The community of learning and inquiry is a good foundation for designing asynchronous online learning environments. We have used this model as the strategy for online courses. We have also included as part of the online learning experience the use of concept map tools to help students construct individual knowledge after participating in collaborative learning. We believe that concept maps can effectively facilitate individual construction of knowledge.

## **LITERATURE REVIEW**

A thorough review of the literature on concept maps and collaborative learning indicates that most articles are descriptions of the authors’ experiences using concept maps in various situations within the context of the online environment. Some of these publications describe the difficulties that students have constructing concept maps. Rábago (2004) states that these difficulties lie in the students’ lack of the tools necessary to build them or a lack of familiarization with the subject of the concept map. One example of this type of difficulty is found in the descriptive article by Laampere, Matsak, and Kippar (2006), which investigates the technological and pedagogical challenges due to the poor integration of concept map tools and learning management systems.

The review of 24 articles on the subject reveals also an experimental study on the use of technology

such as CTOOLS Concept Connector to facilitate students’ visualization of their thinking process online and immediate feedback (Luckie, Harrison, & Ebert-May, 2004). A study based on Novak and Gowin’s (1984) theoretical framework of concept mapping explores methods to design didactic materials based on concept maps (Cabral, Zeve, Nicolao, & Amoretti, 2004). A descriptive article also referencing Novak’s framework investigates instructional approaches to use concept maps in which education students reported that concept mapping aided them in acquiring or improving their skills in studying, thinking, and teaching (Calderón, Agüera, & Alfageme, 2004). Other studies emphasize the benefits of using concept maps to increase organized communication among participants (Tarouco, Geller, & Medina, 2006).

The majority of the literature on collaborative learning and concept maps addresses the work of small groups of learners, generally two or three, constructing concept maps together. Basque and Lavoie (2006) researched 39 published studies on collaborative concept mapping at a distance and face-to-face. The quality of concept maps, the effect of collaborative concept maps on learning, and the integration of ideas and knowledge between learners during collaborative concept mapping are some of the subjects of these studies. The articles reviewed vary in their designs from descriptive, to experimental, to analytical. They are predominantly based on Novak’s theoretical framework of concept mapping. They also vary in the groups that they study. For instance, Cañas, Ford, et al., (2001) focus their experimental study on Latin American school children using asynchronous concept mapping and sharing them through a network called Knowledge Soup. Rice, Ryan, and Samson (1998) scrutinize the use of concept maps in seventh grade life science classes to assess student learning. Many studies focus on high school students; however, some studies such as the one examined by Calderón, Agüera, and Alfageme (2004) investigated the effectiveness of concept mapping as a tool for college education majors.

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