

## Chapter 2.9

# A Comparative Analysis of Computer-Supported Learning Models and Guidelines

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### ABSTRACT

This chapter presents a comprehensive analytical review of computer-supported learning (CSL) design models and guidelines according to the level of emphasis regarding key elements and dimensions of effective teaching and learning within an online environment. The key elements encompass learning activities, learning environment, and/or assessment of student learning. Ultimately our purpose was to identify components that experts considered as critical to achieving effective CSL environments in order to use this information as a framework to design, develop, and implement CSL. The results indicate that the trend in CSL design and development models and guidelines is to create online environments that support constructivist learning that is student-

centered, presents resources in varied formats, supports discussions and/or collaborative and/or problem-based learning as well as independent student research and use of resources.

### INTRODUCTION

When computer-supported learning (CSL) is coupled with the limitless connectivity of the Internet, educational opportunities expand beyond barriers of traditional learning environments. Learning via interactive, virtual Web-based communities and environments now extends into today's K-12 classrooms, universities, and the workforce. CSL allows education to occur independent of the place and time (Moore & Kearsley, 1996) and provides learners opportunities to search,

discover, and utilize information according to their own individual needs (Dabbagh & Bannan-Ritland, 2005; Khan, 1997). Basically, the Internet is a flexible, interactive, and resource rich system that supports student-centered learning (Hill & Hannafin, 2001).

The use of CSL environments is gaining more popularity each day; the number of Web-supported or Web-based courses in training, colleges, and K-12 levels are increasing significantly in the United States (Allen & Seman, 2004; Picciano, 2001; Setzer & Lewis, 2005). For example, approximately 54,000 Web-based courses were offered by 1,680 different institutions in 2002 (Simonson, Smaldino, Albright, & Zvacek, 2003). Over 1.9 million students enrolled in online courses in the fall of 2003, and predictions indicate the number will increase to over 2.6 million in 2004 (Allen & Seman, 2004).

Regardless of capabilities of the delivery medium, typical CSL applications and practices continue to be teacher-directed and delivery-centered (Carr-Chellman & Duchastel, 2001; Naidu, 2003). Merely delivering course content through use of the Web is a common phenomenon in that many course sites are primarily text driven repositories for syllabi, course notes, and electronic presentations (Palloff & Pratt, 1999). Although online publishing of course syllabi and PowerPoint lecture notes can be of value, developing an effective online course involves much more than just transforming existing course materials to a Web format (Burch, 2001; Discenza, Howard, & Schenk, 2002). Yet, this widely used instructional medium is often developed and implemented upon the basis of “what works” in traditional settings, institution-specific guidelines, or recommendations found in a research article or textbook. “Traditional” approaches often include no or limited use of the attributes and functions of the Web that enable the creation of student-centered learning environments. Considerations for developing student-centered environments include selecting the most appropriate method for presenting

content, engaging students in learning activities, and supporting the needs of individual learners (Hirumi, 2002b; Naidu, 2003).

Most would agree that in order for CSL to be effective, research-based models and guidelines should serve as the structural foundation for systematically planning, designing, developing, and implementing the CSL environment. However, the task of selecting a model becomes daunting in that numerous options are presented in current literature. This chapter used a variety of methods to address these concerns. An initial approach involved operationally defining elements, dimensions, and attributes of CSL models. From these definitions, an analysis schema was developed to assess the frequency with which these components are addressed in “effective” CSL models. It is important to note that the purpose of this chapter is not to report on the “quality” of CSL models and guidelines, but rather to present the results of a comprehensive analytical review of published models and guidelines.

## **DESCRIPTION OF ANALYSIS SCHEMA**

The analysis schema for the CSL models and guidelines was created by an extensive review of research on effective teaching and learning in CSL environments (Driscoll, 1999; Hannafin, Hill, & Land, 1997; Hill & Hannafin, 2001; Hirumi, 2002b; Jonassen, Peck, & Wilson, 1999; Land & Hannafin, 2000; Schunk, 2004). The procedure used to create analysis schema includes the following steps: examination of literature, identification of key elements related to teaching and learning in a Web-based learning environment, and grouping these identified elements into main categories. First, to identify key elements, the researchers examined a selection of articles and books related to effective teaching and learning in CSL. Following the examination, a list of key elements was created. For instance, names like

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