Chapter 2.10
Designing Interactive and Collaborative E-Learning Environments

Hyo-Jeong So
National Institute of Education, Nanyang Technological University, Singapore

ABSTRACT

Despite the increasing numbers of online courses, there have been several concerns and criticisms related to teaching and learning in e-learning. Previous research has suggested that students are often dissatisfied and frustrated with their e-learning courses. A more important issue is that e-learning has not led to pedagogical changes. A large percentage of e-learning courses have been developed to deliver simple factual knowledge through tutorial-based instruction. In seeking a paradigm shift from information delivery-centered to learner-centered e-learning approaches, this chapter suggests that theoretically and empirically grounded design frameworks are required, and that strategies for interactive and collaborative learning should be considered and incorporated in designing learner-centered environments. To identify instructional design strategies, the author critically reviewed and analyzed relevant case studies. Three design guidelines are presented with specific strategies and examples: (1) meaningful opportunities for online collaboration, (2) minimization of communication barriers and maximization of idea sharing, and (3) increasing perceived levels of social presence.

INTRODUCTION

During the past decade, there has been a significant movement toward e-learning in higher education and corporate training. Statistics show that 81% of higher education institutions in the United States offer at least one online or blended learning course, indicating that e-learning has been adopted as one of major instructional delivery methods (Allen & Seaman, 2003). University courses have been restructured by adding Web-based components in order to solve problems related to overworked faculty, over-capacity of classrooms, and lack of

interactions in conventional lecture-based courses (Tiangha, 2003). Similarly, corporate sectors have tried to reduce training budgets and staff by converting instructor-led, classroom-based training programs to online learning formats. Recently, blended learning, which combines face-to-face and online course components, has emerged as a new generation of distance education, and increasing numbers of companies are delivering their training programs using both e-learning and traditional methods (Dolezalek, 2005).

Despite the increasing numbers of online courses, however, there have been several concerns and criticisms related to teaching and learning in e-learning environments. Previous research has suggested that students are often dissatisfied and frustrated with their overall learning experiences in e-learning courses (Carr-Chellman, Dyer, & Breman, 2000; Hara & Kling, 2000). Students experience technical difficulties; lack of interactions with instructors and peers; and lack of course structures and support, which all could be attributed to high dropout or incomplete rates in online courses compared to those in residential courses.

A more important issue is that e-learning has not led to pedagogical changes (Zemsky & Massy, 2004). Most instructors tend to teach online courses in ways that they teach traditional lecture-based courses. Students have difficulty with self-managing their online learning processes. A large percentage of e-learning courses have been developed to deliver simple factual knowledge through tutorial-based instruction as seen from a wide use of online PowerPoint-type lectures with heavy text information and linear navigations. Furthermore, current e-learning models, based on traditional transmissionist design approaches, have limitations promoting higher-order knowledge and skills required in the 21st century knowledge society (Bereiter & Scardamalia, 2006).

To overcome aforementioned problems, paradigms underlying current e-learning designs should shift from delivery-centered to learner-centered approaches. Students need to be able to solve complex problems, have critical thinking skills, work effective in teams, and express and adopt diverse perspectives. In seeking this paradigm shift, this chapter suggests that advances in the field of e-learning require a theoretically and empirically grounded design framework guiding design decisions, and that instructional design strategies for interactive and collaborative learning should be considered and incorporated in designing learner-centered e-learning environments where students are actively engaged in their learning processes.

THEORETICAL BACKGROUND AND DEFINITIONS

It is important to understand the theories and meanings underlying the terms *interaction* and *collaborative learning* before looking at specific design strategies. Even though interaction and collaboration are common terms often used in e-learning contexts, a lack of functional definitions has been a serious problem in forming basic and shared ideas among researchers and practitioners. This section discusses definitions and theoretical background supporting interactive and collaborative learning and provides working definitions used in this chapter.

Interaction

Moore (1989) emphasized the need for a clear and functional definition of interaction by stating that "Interaction is another important term that carries so many meanings to be almost useless unless specific sub-meanings can be defined and generally agreed upon" (p. 1). Similarly, Wagner