

Chapter 4

Designing Dynamic Learning Environment for Web 2.0 Application

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ABSTRACT

The growth of online resources and the advancement of Web 2.0 technology are changing the instructional landscape and have significantly impacted the practices in education. With its ill-structured learning and rapid incrementation of information in a non-linear fashion, Web 2.0 learning poses enormous challenges to online instructional designers and teachers. The traditional ID models are deemed less fit for Web 2.0 learning due to their linear, well-structured design approach. This chapter proposes a new ID model that specifically addresses the cognitive demands involved in Web 2.0 learning, promotes learning that focuses on metacognitive thinking and self-regulation, facilitates knowledge integration and construction of schemas-of-the-moment for ill-structured learning, and delivers an environment by connecting activities with behavior to form a dynamic learning environment in Web 2.0 application.

INTRODUCTION

The presence of new technology like Web 2.0 application has dramatically changed the instructional landscape in education (Brewer & Milam, 2006; Ellison & Wu, 2008; Glass & Spiegelman, 2007). Many universities, including K-12 schools, are already exploring the instructional use of Web 2.0 technologies such as blogs, wikis, iPods, podcasting, text messaging, and other social software like

distributed classification systems (Glogoff, 2005; Ferris & Wilder, 2006). One of the challenges to use Web 2.0 application in education is to effectively design and develop instruction that prepares learners for discovery, change, and creativity in a highly complex and challenging learning environment.

Research shows that as technology has increasingly become a key component in teaching and learning, the amount of effort and enthusiasm that goes into the development and implementation of new technology often fails to yield desired results (Oliver & Herrington, 2003). This is due partly to

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poor implementation of technology in learning and partly to a lack of effective instructional models and strategies that support such implementation. Current instructional design (ID) models are only moderately successful in taking advantage of the new online medium (Irlbeck, Kays, Jones, & Sims, 2006) because the existing models are characterized by a linear implementation procedure which suits well for well-structured learning but is less appropriate for complex, ill-structured learning (DeSchryver & Spiro, 2008), thereby omitting the most effective and innovative options for successful and creative online learning like Web 2.0 technologies. The inconsistency between existing ID models and practices has impeded the successful integration of new web technologies like blogs, podcasting, wikis, etc. into teaching and learning. Hence the need for a new ID framework that addresses the complexity in Web 2.0 learning. The chapter starts with a discussion of the characteristics of Web 2.0 learning and relevant cognitive demands associated with such learning, followed by a review of ID models which includes the traditional ID models, non-linear system instructional design (SID) models, and emergent e-learning ID models. Finally, a new ID framework is proposed for designing nonlinear, ill-structured learning in Web 2.0 application.

WEB 2.0 LEARNING AND COGNITIVE DEMANDS

Akbulut and Kiyici (2007) describe Web 2.0 technology as the second generation web services which provide a new learning platform for online collaboration and sharing among web users. These services enact a perceived transition from static and isolated information chunks as represented by the learning model of the first generation web services to self-generated and open communication where the authority is decentralized allowing end-users to use the web space as a conversation field (Collis & Moonen, 2008). Whereas the first

generation web services are characterized by a search for information coupled with well structured instructional strategies like WebQuests to facilitate learners' knowledge acquisition (Zheng, 2007), Web 2.0 learning reflects a participatory, collaborative, and dynamic approach with which knowledge is created through the collective efforts of participants (Rogers, Liddle, Chan, Doxey, & Isom, 2007). In this section the discussion will primarily focus on the idiosyncratic features of Web 2.0 learning and cognitive demands associated with such learning.

Characteristics of Web 2.0 Application

The traditional Web technology which is also known as the first generation Web technology reflects a one-to-many model in which the content was designed and developed by an individual, a team, a company, an institute or an organization (Breeding, 2006; Kesim & Agaoglu, 2007). The primary purpose was for readers to consume the information. For example, many of the early Websites were text-based serving as an information pamphlet for the business and industry, or as didactic lecture notes in education (Andrews, 1999). With the advent of the second generation WWW, namely Web 2.0 technology, information as well as knowledge are no longer distributed by an individual, a team, a company, an institute, or an organization. Rather, they are distributed and created by users within the cyber community. The new Web 2.0 technology is characterized by shared ownership, simultaneous traversals of multiple knowledge spaces, and social negotiation (DeSchryver & Spiro, 2008; Kesim & Agaoglu, 2007; Wang & Hsua, 2008). A discussion of each of those characteristics follows.

Shared Ownership

Differing from the first generation WWW, Web 2.0 technology is designed to create a forum

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