Chapter XI

Using Situated Learning as a Design Strategy for Web-Based Learning

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Many writers argue for a place for the use new educational technologies from the perspective of IT management (e.g., Holt & Thompson, 1998). This form of reasoning sees a technological, rather than educational, imperative as leading the move to embrace learning technologies. The technological imperative sees the need and place for information technologies in education being based on such organisational factors as opportunity, competition and efficiency. When such imperatives are driving change, the applications of learning technologies are more likely to be made through additive strategies which see existing strategies and methods being complemented by technology-oriented initiatives. Many writers argue for more integrated approaches which have the potential to redefine and transform the more fundamental aspects of teaching and learning (e.g., Collis, 1997), that is, a pedagogical imperative.

Teachers are using the Web for a variety of reasons and the extent and scope of the usage differs significantly. A majority of current Web-based learning environments have evolved from face-to-face teaching programs in the additive form described above. Typically the first step in the evolutionary process is the creation of an electronic form of existing course content. This content usually takes the form of HTML with hyperlinks to related information within and beyond the immediate course. An added feature is often a communicative element enabling interactions between learners and the teacher. What is characteristic in much of this development is the absence of any particular Web-based instructional design. The purpose of this paper is to explore a possible Web-based instructional design model that seeks to make optimal use of the opportunities and advantages of the Web as a learning environment and which can return enhanced learning outcomes.
WEB-BASED INSTRUCTIONAL DESIGN

The majority of learning theories guiding technology-based instructional design today are based on constructivist principles which value the role of an active learner in the learning process working with information to derive meaning and understanding. In contemporary computer-based learning environments, activities are often embedded in curriculum sequences, so that computers become a learning partner, rather than a medium for direct instruction or a generic tool. The logic and reason behind this application of the technology stems from the need for effective learning tools not to represent the world to the learner but to assist the learner in building meaningful, personal interpretations and representations of the world (Jonassen, Mayes & McAleese, 1993).

There are several strong theoretical foundations to guide instructional design for the Web-based learning environment. For example, Spiro, Feltovich, Jacobson & Coulson (1991a) argue that there are special requirements for attaining advanced learning goals given the impediments associated with ill-structured features of knowledge domains. They describe the value of a criss-crossed landscape, multiple dimensions of knowledge representation, and multiple interconnections across knowledge components—all elements of learning that care readily supported by hypertext domains and communication facilities of the Web. Jonassen & Reeves (1996) use the term cognitive tools to describe computer-based learning applications which assist learners in representing their own knowledge of the external world. Cognitive tools when used appropriately can engage learners in higher order thinking and learning providing opportunities for the acquired knowledge to be generalised to new and alternative problem spaces and contexts.

Until the invention of schools, nearly all formal knowledge and skill was transferred through apprenticeships (Collins, 1988). In the 1980s, teachers and researchers in education began to investigate the notion of apprenticeships and to try to distinguish those characteristics which were critical to its success. Their aim was to begin the process of developing a theoretical perspective for learning based on the apprenticeship model. Brown, Collins and Duguid (1989) were the first to use the ideas to produce a proposal for a model of instruction that has implications for classroom practice. In their model of situated cognition, Brown et al. (1989) argue that meaningful learning will only take place if it is embedded in the social and physical context within which it will be used.

We have previously used the concepts of situated cognition and situated learning as successful design strategies for technology-based multimedia and it has strong prospect for application in Web-based learning. Situated learning as a model of instruction has grown out of a general theoretical shift within the educational community from ‘behavioral to cognitive to constructivist’ learning perspectives (Ertmer & Newby, 1993, p. 50). It provides strong contexts for learning and is strongly supported in a Web-based environment by the information and communication capabilities of the technology.

Situated Cognition and Web-Based Instructional Design

Our previous research (Herrington & Oliver, 1995; 1998) identified nine discrete characteristics as critical elements in designing learning environments based on the principles of situated cognition and situated learning. The identification of these characteristics was enabled through a distillation of the extant literature describing this learning theory and those closely related to it. Through this process we developed a set of guidelines which could be used to inform instructional design processes associated with operationalising
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