Chapter 2
The Recursive Knowledge Development Model for Virtual Environments

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ABSTRACT

The concept of leveraging strategic control of the knowledge from teachers to students in virtual learning environments serves as the basis for determining how to move students through stages of knowledge acquisition to knowledge application and ultimately to knowledge generation in online settings. Instructional strategies for fostering student engagement in a virtual learning environment are identified as critical, and a number of relevant theories focusing on student learning, affect, needs and adult concerns are presented to provide a basis for transfer of knowledge from teacher to learner. A model is presented that combines the dimensions of knowledge approach, knowledge authority and teaching approach to demonstrate the recursive and scaffold design for the creation of virtual learning environments.

INTRODUCTION

Virtual environments offer challenges and opportunities for innovative teaching and enhancement of student learning. Critical to this process are strategies to foster transfer of knowledge generation dispositions from teacher to learner. Implicit in this process is the facility for transitioning new knowledge to become internalized knowledge for learners so they may address specific problems they encounter, which is often the ultimate goal of organized educational programs. In this facilitated learning paradigm, gradual release of responsibility for the learning shifts over time from the teacher or facilitator to the learner. During this process, the learner ultimately develops strategic control of the knowledge as may be evidenced through social interaction within the virtual environment.

In traditional classrooms and educational activities, the teacher is central to the learning process. The teacher serves variously as guide, facilitator, motivator, and often as the authority for knowledge structure and student behavior when engaged in the learning process. This role

DOI: 10.4018/978-1-61692-822-3.ch002

changes in the virtual environment, where students often engage without observation or direct guidance from the teacher. The creator of a virtual learning environment must make certain assumptions. These assumptions are not small, but deal with the very nature of knowledge and knowing. These assumptions must be acknowledged and employed to guide the construction of virtual learning environments.

DIGITAL INTELLIGENCE: A RESPONSE TO DIGITAL ENVIRONMENTS

In a previous discussion, Adams (2004) put forth the notion that a new intellectual style is emerging as a response to the interaction with digital technologies. Using the established Multiple Intelligences theoretical framework developed by Gardner (1993), it was argued that by recognizing a meta-intelligence termed Digital Intelligence, development of effective teaching and learning strategies to accommodate this new intellectual style would emerge. The model presented here seeks to serve this purpose and to further this argument.

THE CONFLICT

The basic philosophical conflict in construction of virtual learning environments lies in the basic belief about what is considered knowledge, the structure of that knowledge, and what knowledge should be valued or championed. This may be illustrated by a brief discussion of the modern and postmodern views about reality and knowledge.

Modernists believe that reality exists objectively and generally believe that knowledge has a definable structure. They believe it is the charge of the teacher to either lead or facilitate inquiry for students to discover this pre-existing structure and incorporate it into their own knowledge base to solve problems in a way that demonstrates their systematic understanding of a body of knowledge.

In general, postmodernists believe that reality is a human creation that is socially constructed. The postmodern view that reality changes–and is constructed differently by each individual–necessitates less structured, more individually-oriented learning environments that provide student choice and serve to rely on the strategy of gradually allowing the learner to explore existing knowledge structures as they create their own knowledge structures. The focus is on the learner ultimately generating his or her personal knowledge from existing knowledge and information they encounter. Context often provides the social element for construction (Ozmon & Craver, 2007).

Virtual environments exemplify postmodern belief. This highly changeable and infinitely responsive environment is wholly constructed by the mind of the author and then reconstructed by the mind of the visitor. The notion that rigid structure may be applied in this environment is only a computer virus away from changed reality. It is of great concern to the author that these virtual learning environments seek to develop whole, rather than partial constructions of reality, knowledge and knowing.

DIGITAL ENVIRONMENTS DESIGNED FOR LEARNING: SUPPORTING THEORIES

The modern-postmodern conundrum is easily demonstrated by past and present approaches to the construction and use of online learning environments. Technological skill and educational expertise have not always been of equal measure in creating online learning environments. Those who could manipulate computer code were not necessarily versed on educational theory, and those who held reasoned philosophically grounded views on the nature of teaching and learning were rarely immersed in software design. Surely, with