Chapter V
Applying Constructivism to Online Learning:
A New Instructional Design Map

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ABSTRACT

Based on constructivist principles, this chapter provides a new instructional design map for online learning environments. This instructional design map includes considerations of five elements, namely, learner, knowledge, learning environment, assessment, and technology. Considerations of these elements are based on analyses of the past and existing instructional design models, online learning models, and constructive principles. Applications of the instructional design map are also discussed in the chapter.

INTRODUCTION

Dijkstra (2005) defines instructional-design theory as a set of statements that interpret why an instructional program leads to the acquisition of knowledge, skills, and attitudes. Although practitioners and researchers readily agree with this definition, there is much disagreement over which instructional theory or model can best accomplish the objective. This is not surprising as there has been considerable debate in the teaching and learning communities, over many decades about how students think and best learn.

In the past 50 years or so, three major influences have largely accounted for the many changes and debates surrounding instructional design theories

and models. Dijkstra (2005) cites "the rediscovery of epistemology, the renewed interest in nature and knowledge acquisition, and the invention of the computer and the development of information and communication technology" (p. 187) as the dominant influences in the field of cognition and learning since the 1950s.

In this chapter, we start by briefly discussing the three major influences in the field of instructional design to underscore the importance of understanding the lineage of contemporary design theories in our quest to prepare a new generation of learners. We will then provide an overview of the ontological, epistemological, and methodological principles that guide the design of our proposed instructional design map theory for online teaching and learning. Although instructional design theories and online learning models target technology-enhanced teaching and learning environments, the developments of the two have evolved separately from one another. Therefore, we aim to bring the two together by examining each through the constructivist lens in the new media and technology environments. In the final section, we will explain how the new design map is expected to result in effective learning and why this is an improvement over existing theories. Discussions on how to apply the theory in practical settings and assessment strategies will also be outlined.

THREE MAJOR INFLUENCES IN THE INSTRUCTIONAL DESIGN FIELD

Research on Cognition and Learning which Started in the 1950s

"There are two main theoretical approaches in the field of instructional design: the systematic approach and the constructivist approach" (Fardanesh, 2006, p.3). According to Tennyson and Schott (1997), instructional design was driven by behaviorism in its early stages. Behaviorism places an emphasis on producing observable and measurable outcomes in students (Ertmer & Newby, 1993). Learning occurs when learners demonstrate the desired behavior in response to a stimulus (Smith & Ragan, 1999). Much of the research and work in 1950s and even 1960s focused on how to design systematic instructions to help learners achieve learning objectives through reinforcement, reward, and punishment

Cognitivism gradually succeeded behaviorism in the 1970s and 1980s as researchers studied the influence of mental processes on learning. Cognitivists believe that learners participate actively in the process of knowledge acquisition and construction. Tennyson and Schott (1997) noted that the definition of instructional design at this point "shifted to considerations of learning theory and the development of models linking these theories to the design of instruction" (p.7). Some of the models and theories introduced during this period are still influential today.

In the last decade, Otting and Zwaal (2006) observed that the "traditional views of education and the focus on absolute truth have been gradually replaced by a diversity of more dynamic, pluralist, and relativists conceptions" (p. 347). Constructivists, identifying themselves with Piaget and Vygotsky and representing an array of perspectives, view learning as a process of constructing meaning from experience. Unlike the traditional instructional systems approaches of designing instruction, constructivists hold that "all knowledge is socially constructed" (Molenda, 1997, p.46). According to Gold (2001, p.37), "knowledge is not separate from but rather embedded within experiences and interpreted by the learner." Karagiorgi and Symeou (2005, p.17) further stated that "constructivism makes a different set of assumptions about learning and suggests new instructional principles." Learning is seen to be an internal construction of reality by the individual. The cognitive process of meaning making is emphasized both as an individual mental activity and a socially interactive interchange.