Chapter 2
Reaching "Creating" in Bloom's Taxonomy:
The Merging of Heutagogy and Technology in Online Learning

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ABSTRACT

Creativity of thought and critical thinking are two concepts that faculty struggle with teaching in higher education, particularly in the distance learning environment. Bloom's taxonomy has been used to define taxonomic levels in learning since the 1950's; "create" is one of its highest taxonomic levels. It can be difficult to create relevant, authentic assessments that require students to display both synthesis of meaning, as well creative synthesis of concepts learned to reach this "create" level in an effective manner. Transformative learning and especially heutagogy or "self-determined learning" can be used as theoretical curriculum models or frameworks to help students learn and solve problems. These two theories are particularly effective when leveraged with technology. Today's instructional technologies allow students to more readily create and explore new concepts on their own to generate a more fulfilling education process with meaningful relevant practice and assessment.

INTRODUCTION

Pedagogical practices have primarily been somewhat consistent since the mid-twentieth century. In the last two decades, there has been a significant movement towards other educational theories such as andragogy, transformative learning, emerging pedagogies and heutagogy. This movement has primarily been driving by online/distance learning and the globalization of the virtual classroom. Even before this movement, there has been significant complaint from teachers, professors and employers that students cannot think critically and lack creative problem solving skills. Continual movement to emerging pedagogies, thoughtful use of technology in an appropriate manner, problem-based curriculum and a

movement towards heutagogy is one way this problem can be overcome. This can be accomplished through appropriate curriculum mapping and alignment with appropriate assessment to ensure students can achieve learning in the evaluation and particularly creation levels of Bloom's taxonomy.

This chapter will discuss the concepts of critical thinking, volition and creative thought within the context of traditional and emerging pedagogies in an attempt to build a case for creative and authentic educational curriculum and assessments that leverage technology. Technology can assist educators to create assessments that reach this "create" level in Bloom's taxonomy and move the educational process from teacher-led pedagogies to self-determined learning. The intent is to serve as a basic guide for educators in how these theories and concepts can be used to promote critical thinking and creative thought in this age of technological advances in education.

CRITICAL THINKING, VOLITION AND CREATIVE PROBLEM SOLVING

Critical Thinking

What is critical thinking and creative problem solving and why do employers and faculty require them? According to the Foundation of Critical Thinking (2015), the concept of critical thinking gained relevancy in the late twentieth century although the journey truly began with the experiments of Edward Glaser in 1941. Glaser noted three major components of critical thinking: 1) being able to consider and be thoughtful about problems within the context of one's own experience, 2) the ability to understand reasoning and logical inquiry, and 3) being able to apply concepts one and two. He notes in order to think, one must first recognize a problem exists and look for evidence to reach conclusions. In addition, one must be able to evaluate both sides of an issue, understand inherent bias, interpret data and be able to appraise and discriminate the context of the problem. This is done based on one's experiences, beliefs, and past learning. Most importantly, one must come to conclusions and test them.

The Foundation of Critical Thinking's formal definition stems from a presentation by Michael Scriven and Richard Paul in 1987 at the 8th Annual International Conference on Critical Thinking and Education Reform. Their definition of critical thinking is:

Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication, as a guide to belief and action. In its exemplary form, it is based on universal intellectual values that transcend subject matter divisions: clarity, accuracy, precision, consistency, relevance, sound evidence, good reasons, depth, breadth, and fairness (Foundation for Critical Thinking, 2013, para 1).

Critical thinking has been present since the beginning of time. Without critical thinking, early man would never have been able to feed himself, live, progress and prosper. The Industrial Age occurred long before the concept of critical thinking was truly identified by Glaser (1941). The United States was the first country to create an atomic bomb and put man on the moon before the concept of critical thinking took root. So this poses the question: did critical thinking exist previously in the American culture and it was lost somehow within the last half a century? Or have advances in technology which have made our lives easier somehow impacted the ability to think creatively? These questions are not

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