Taxonomy of Collaborative E–Learning

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INTRODUCTION

The Taxonomy of Collaborative E-learning offers a new conceptual framework for understanding levels of collaboration. This framework can be used to plan, organize, and assess e-learning activities so participants learn to achieve collective outcomes. The Taxonomy of Collaborative E-learning is grounded in the results of a qualitative study that explored an in-depth view of instructors' perceptions of teaching with online collaborative methods, and descriptive examples of their approaches. Study findings were used to refine and build on the researcher's original designs for the "Taxonomy of Collaborative Learning."

BACKGROUND

Educational Taxonomies

What is an educational taxonomy? Scientists have used this term to describe biological systems. "A taxonomy is a system of categories or classifications that are used for purposes of organization, conceptualization, and communication" (Gilbert, 1992). Benjamin Bloom adapted the concept of taxonomy from scientific to educational purposes. He observed that, beyond just classifying observations, a taxonomy should clarify the relationships among classes of phenomena. "While a classification scheme may have many arbitrary elements… a taxonomy must be so constructed that the order of the terms must correspond to some 'real' order among the phenomena represented by the terms" (Bloom, Engelhart, Furst, Hill, & Krathwohl, 1956). By showing relationships between concepts and the skills needed to understand and use them, educational taxonomies provide an organizational framework educators can use to structure progressively more complex learning activities. Taxonomies can facilitate communication among educators by providing a common language for discussing ways to address various educational dilemmas.

The Taxonomy of Collaborative E-learning builds on the work of Bloom and others who have developed taxonomies for educational purposes.

Bloom's Taxonomy

The materials known as "Bloom's Taxonomy" are actually the product of a team of five educators: Max Engelhart, Edward Furst, Walker Hill, David Krathwohl, and Benjamin Bloom (Bloom et al., 1956). These materials were organized as three taxonomies for the cognitive, affective, and psychomotor domains. The "Taxonomy of Educational Objectives for the Cognitive Domain" discussed here is a framework that shows six levels of thinking, from knowledge through evaluation.

The original purposes for Bloom's Taxonomy were to create tools for evaluation and an impetus for exchange of evaluation instruments and strategies. Bloom's team wanted to counter what they saw as a general focus on evaluation of rote memorization. The work of George Stoddard provided conceptual foundations for this focus on evaluation. Stoddard, President of the University of Illinois and New York Commissioner of Education, was interested in the meaning of intelligence and discussed its implications for education generally, and testing in particular. He believed that "intelligence is defined as *the ability to do abstract thinking"* (Stoddard, 1944). Bloom's Taxonomy derived much of its philosophical foundation from the work of John Dewey. Bloom echoes Dewey's view that educators must expect more than rote learning. Both Dewey and Bloom believed that "knowledge is of little value if it cannot be utilized in new situations or in a form very different from that in which it was originally encountered" (Bloom et al., 1956 p. 29).

The concern for active engagement of learners promoted by Dewey and the concern for abstract thinking and thoughtful assessment promoted by Stoddard were synthesized into Bloom's Taxonomy.

Educators across disciplines from K-12 through graduate level who use Bloom's Taxonomy want to do more than teach content, they also want to foster

development of critical thinking skills. These educators understand that it is not enough for learners to acquire information; learners also need to know how to use, apply, and evaluate information, and how to create new knowledge. When an educator creates a learning experience with Bloom's Taxonomy as a guide, learners are encouraged to pursue two goals through that experience: acquiring competencies in the content area and learning how to learn through critical thinking. Bloom's Taxonomy motivates educators to scaffold assignments in such a way that learners will accomplish progressively challenging activities at different conceptual or procedural levels.

The wide use of Bloom's Taxonomy by educators in diverse settings indicates that such conceptual frameworks are useful to those who plan and design educational offerings.

Collaborative E-Learning

Collaborative e-learning fuses two ideas: e-learning and collaborative learning. The literature includes diverse definitions of the term collaborative learning. Roschelle and Teaseley defined collaborative learning as a "coordinated activity that is the result of a continued attempt to construct and maintain a shared conception of a problem" (Teaseley & Roschelle, 1995 p. 70). Pierre Dillenbourg and his colleagues admitted that their team of researchers could not agree on a definition of collaborative learning that would encompass all the important elements. Their working definition described "a situation in which two or more people learn or attempt to learn something together," and their research focused on three elements: the situation, the group, and the nature of group learning. The learning activity on which they focused their research involved "joint problem-solving, and learning expected to occur as a side effect of problem-solving, measured by the elicitation of new knowledge or by improvement of problem-solving performance." They argued that collaborative learning is not a mechanism nor a method, but a "situation in which particular forms of interaction among people are expected to occur, which would trigger learning" (Dillenbourg, Baker, Blaye, & O'Malley, 1999, pp. 1-2). Collaborative learning encourages development of skills about how to collaborate.

Learning [is] associated with understanding how to make judgments about, and seek to manage, trust, power, goals and opportunism in collaborative contexts [and] learning associated with understanding how to effect mutual communication, engage with partners' procedures, negotiate politics and develop effective structures and processes for the particular collaboration (Huxham & Hibbert, 2005, p. 66).

Interaction is intrinsic to collaboration (Gray, 1989; Wood & Gray, 1991). While not all interaction is collaborative, all collaboration builds on interaction among participants. Educators since John Dewey have pointed to interaction as intrinsic to education. Constructivists and social constructivists believe that learning occurs when learners interact with each other and their environment (Jonassen, 1994; Moore & Kearsely, 1996; Vygotsky, 1978, 1987; Weil & Joyce, 1978). Collaborative learning emphasizes learner-learner interaction in situations where the learners have some level of autonomy or responsibility for determining how decisions are made for accomplishing the learning goal. In this way, collaborative learning is differentiated from *cooperative learning,* where the instructor retains control and determines subtasks that partners solve independently (Dillenbourg & Schneider, 1995; Teaseley & Roschelle, 1995).

Learner-learner interaction takes on new significance in the online learning milieu, where it can help reduce the isolation some may feel when they do not share geographic proximity with the instructor and other learners (Lemak, Reed, Montgomery, & Shung, 2005; Mabrito, 2005; Rankin, 2005) Collaborative e-learning can complement individual study and leverage the power of learner-learner interaction. E-learning is defined for this study as an educational activity or course conducted in an electronic learning milieu, using Internet communication technologies for delivery of instruction, curricular materials and learning activities. In this study, e-learning refers to instructor-lead academic courses that may be offered partially or entirely online.

Collaborative e-learning is defined for this study as constructing knowledge, negotiating meanings, and/or solving problems through mutual engagement of two or more learners in a coordinated effort using Internet and electronic communications.

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