

Expect Originality! Using Taxonomies to Structure Assignments that Support Original Work

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EXPECT ORIGINALITY! USING TAXONOMIES TO STRUCTURE ASSIGNMENTS THAT SUPPORT ORIGINAL WORK

ABSTRACT

The online world offers opportunities to appropriate others' work, while simultaneously offering opportunities for valuable research and creative exchange. The use of secondary research materials in academic writing can be represented as a continuum, with "plagiarism" on one end and "original work" on the other. Educators can take steps to prevent plagiarism by designing assignments that expect learners to respect others' ideas and strive toward creating their own original work. Educational taxonomies, including the Cognitive and Affective Domains of Bloom's Taxonomy, and the author's Taxonomy of Collaborative E-learning, can serve as conceptual frameworks for designing assignments that 1) expect learners to present original work; 2) provide opportunities for learners to develop new ideas through meaningful online interaction; and 3) value learners' ideas while respecting published authors' intellectual property.

Keywords: Original work, online instruction, collaborative e-learning, Bloom's Taxonomy, Taxonomy of Collaborative E-Learning

INTRODUCTION

While plagiarism involves ethical dilemmas in regard to misrepresentation of work and/or violation of copyright rules, it also involves dilemmas for teaching and learning. When learners represent others' ideas as their own, they are not developing their own ideas. When learners plagiarize they are not developing the thinking, research and writing skills necessary to successfully achieve the learning outcomes of a course and to prepare for professional life.

The online world offers easy access an extensive array of work by other writers. Learners no longer need to re-type material; they can easily find writings in electronic format on any subject, select, copy and paste it, and call it their own. The same technologies that make it easy to plagiarize also facilitate a rich culture of free exchange emerging in the online world. Sharing, forwarding, linking and blending information and media are intrinsic to life in the online world. Participants in this culture do not see use of materials they find online as stealing someone else's intellectual property. Similarly, learners who make free use of materials they find online for academic work do not see it as plagiarism (Kraus, 2002; Madden & Rainie, 2003, 2005; Renard, 2000; G. Wood, 2004 p.299). Since learners tend to study in an academic context using the same processes they use in informal interactions, it is not surprising that practices used to complete their assignments are similar to those they use in everyday interactions with friends (Crook & Light, 2002). Clearly, approaches being used to address plagiarism must take into account profound changes to the world of information and the ways it is accessed and used.

This chapter proposes a model for thinking about use of resources in academic work as a continuum, with "plagiarism" on one end and "original work" on the other. Strategies for addressing the issues at each point on the continuum are discussed. While achieving proper attribution of sources represents success in terms of academic honesty, other steps are needed to

ensure that higher order thinking and learning occurs. This chapter focuses on ways educators can plan and facilitate learning assignments that discourage cheating by encouraging learners to aim for original work.

The chapter explores ways that educators can support the positive aspects of learners' use of the Internet to locate diverse materials and exchange ideas with peers within an academic culture that respects intellectual property. In particular, this chapter shows how educators can use Bloom's Taxonomies together with the Taxonomy of Collaborative E-Learning as a framework for designing learning activities that make productive use of online materials and peer collaboration.

BACKGROUND

Four broad strategies to combat plagiarism are frequently mentioned in the literature:

- ◆ Having, promoting and administering clear, institution-wide policies for academic honesty;
- ◆ Using electronic detection tools such as Turnitin.com or using a search engine to find sources of suspicious phrases;
- ◆ Teaching the proper use of sources by defining plagiarism and educating learners in methods for citation; and
- ◆ Designing meaningful and unique assignments to minimize the opportunity for cheating.

Educational institutions widely recognize the need for policies on academic honesty. An institutional approach should ideally be embedded into academic rules and regulations and promoted throughout the institution (Park, 2004). The Center for Academic Integrity suggests four stages for developing academic honesty policies and diffusing them into campus life. At the first stage, no policy is in place. The next stage involves building faculty and student awareness of academic honesty issues and options. At the third stage, the institution has policies that are widely known but not fully supported. At the fourth stage, policies are widely understood and students are involved in development and implementation of academic honesty policies (Drinan, 2006).

At best, policies alone are an imperfect solution for addressing plagiarism. One study, based on an experiment with two large undergraduate classes, found that “warning students not to plagiarize, even in the strongest possible language, appears not to have had any effect

whatsoever. Revealing the use of plagiarism-detection software to the student...on the other hand, seemed to be a remarkably strong (though not perfect) deterrent" (Braumoeller & Gaines, 2001 p. 835). Similar results were found in a study conducted at Murray State University in Kentucky: students "who have a stronger belief that plagiarism will be detected will be less likely to plagiarize" (D. Martin, 2005 p. 152). Electronic detection services such as Turnitin.com, and the use of search engines to locate copied text are becoming popular deterrents.

At the same time, many educators voice concerns about widespread use of electronic detection and the perceived role for instructors as enforcers. Martin represents the viewpoint of many instructors who believe that "the policing approach is educationally counterproductive" (B. Martin, 1992). Some fear that routine plagiarism checks might breed an atmosphere of suspicion and mistrust, and undermine the intellectual fabric of the academy. The unintended consequence they fear is that "rather than being mentors to students; we are replacing the student-teacher relationship with the criminal-police relationship" (Howard, 2002 p. 47; Park, 2004). Renard states the concern bluntly: "catching cheaters is not the best answer. It's a lot like doing an autopsy. No matter how terrific the coroner is at determining how or why a person died, the damage has been done" (Renard, 2000 p. 41). She points out that "our interest lies in helping students learn to document sources, not in prosecuting cheaters" (p. 40).

It is not surprising that, while educators believe blatant cheaters should be punished, they prefer instructional approaches to punitive ones. As Purdy observes, "rather than panic that students are now rampantly plagiarizing at numbers never known before, we must take a step back to consider the role the writing technologies they use play in their writing processes and consider how we as teachers—rather than hunters, police officers, or super sleuths—can pedagogically address these technologies" (Purdy, 2005 p. 291). Howard similarly advocates

changes to curriculum, even when that implies a major change to an instructor's approach to curriculum development. She states, "we risk categorizing all of our students as criminals. Worst of all, we risk not recognizing that our own pedagogy needs reform. Big reform" (Howard, 2002 p. 47).

One way instructors can change curricular approaches to prevent plagiarism is by clearly defining plagiarism and teaching learners appropriate methods to give credit for ideas they quote or paraphrase. *The Good Practice Guide to Plagiarism* recommends that colleges and universities offer compulsory teaching sessions on academic writing and citation skills (Carroll & Appleton, 2001). The online Kaplan University has implemented this approach, with a three-unit segment in the required *Effective Writing I* class covering: 1) citations, 2) APA style and 3) plagiarism. "The order is intentional; plagiarism is a scary word, and if they are thinking about it before they learn citation, they don't learn citation as well. If they learn citation first, then once they get to plagiarism, they already have the skill set to avoid it" (K. VanDam, personal communication, September 26, 2006). An example of non-compulsory instruction in proper techniques is the use of online writing centers. Such centers can offer faculty and learners alike information and skills-development in all areas of academic writing.

Many instructors feel that improved teaching of citation protocols needs to be part of a broader set of changes to instruction and assignments for the Internet age. "Conventional teaching invites plagiarism," is the premise stated by Arthur Sterngold, who recommends "learner-centered approaches such as hands-on, active and collaborative learning methods" (Sterngold, 2004 p. 18). John Moye, Director of Curriculum Development at Capella University, points to educators' responsibilities: "If a learner can plagiarize, something was wrong with the assignment" (J. Moye, personal communication, September 15, 2006) Moye describes a

framework for assignments that requires integration of the learner's explanation of external information (instructional messages, readings etc.), internal reflection on relevant experiences, and discussion of new understandings that emerge from this synthesis of internal and external information. Each learner's assignment will necessarily be unique, because no two learners could identically process internal and external information. He recommends that instructors keep learners engaged in the process of learning and encourage them to continually re-evaluate previously held ideas.

High school principal Mitchell Shron, also suggests that curricular approaches can minimize plagiarism. He states that: "Interesting assignments will result in interesting responses; rote responses will result in rote responses" (M. Shron, personal communication, September 18, 2006). He also says:

don't keep the [review] process secret—pull back the curtain. Give the students tools to critique, so it is no surprise. Use Bloom's Taxonomy as a lesson. Share with students the meaning of metacognition. Make it clear: we expect synthesis. In assignments ask students: 'can you create something original?' Not every student will hit the high point, but some will (M. Shron, personal communication, September 18, 2006).

Other suggestions include avoiding broad, fact-based assignments, discussing research with learners, and including information gathering as an outcome in its own right. (Carroll & Appleton, 2001; McLafferty & Foust, 2004) *The Good Practice Guide to Plagiarism* recommends instructional practices that provide learners with opportunities for discussion, practice and feedback (Carroll & Appleton, 2001).

Bruner's pre-Internet observations support the arguments made in contemporary literature: "The best way to create interest in a subject is to render it worth knowing, which means to make the knowledge gains usable in one's thinking beyond the situation in which the learning has occurred' (Bruner, 1977 p. 31). Many educators still believe that when learners perceive a subject as "worth knowing" and relevant to their own inquiries, life and work, they will be engaged in the learning process enough to contribute their own insights. As Park suggests, a balanced and positive approach to plagiarism would emphasize prevention and improved attention to instruction and education, backed up by robust and transparent procedures for detecting and punishing plagiarism. "If successful, such an approach would create a level playing field on which staff and students can operate, to the benefit of all stakeholders" (Park, 2004 p. 299)

PLAGIARISM: IT IS NOT BLACK AND WHITE

What is *plagiarism*? The college Writing Program Administrators Council says that "in an instructional setting, plagiarism occurs when a writer deliberately uses someone else's language, ideas, or other original (not common-knowledge) material without acknowledging its source" (*Defining and avoiding plagiarism*, 2003). Whether the thoughts of another author are used directly or are imitated, it is plagiarism. The *Publication Manual* of the American Psychological Association states that plagiarism includes ideas as well as specific text (APA, 2001).

Plagiarism issues are too complex for a simplistic right and wrong assessment. Plagiarism may occur intentionally or inadvertently. In an educational context, these are important distinctions because dishonesty generally requires administrative repercussions whereas careless attribution generally entails response from the instructor. A continuum provides a way to look at purposeful plagiarism at one end of the spectrum, and original work at the other end.

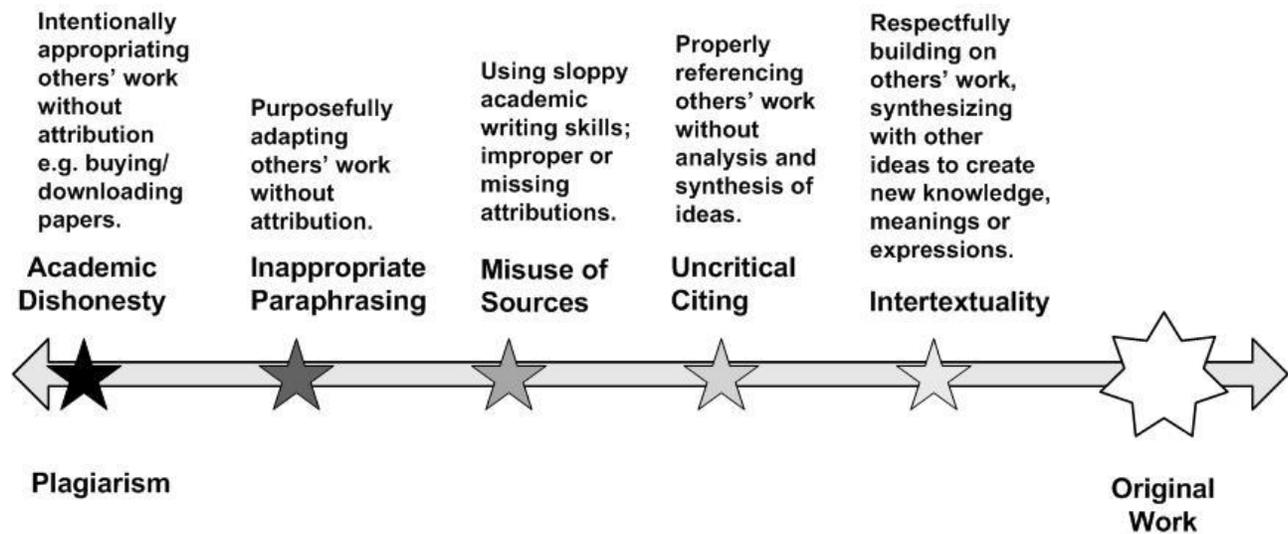


Figure 1. Plagiarism as a Continuum

Points on the Continuum: Definitions

Academic Dishonesty: When learners purposefully appropriate all or part of an assignment from another source and represent it as their own, they do not benefit from the learning intended for the assignment. This kind of intentional plagiarism constitutes academic dishonesty.

Inappropriate Paraphrasing: When learners simply re-arrange the order of words in sentences or change words to synonyms, they may present their own words but are not their own ideas (APA, 2001; Share, 2006). This type of paraphrasing is a purposeful misrepresentation of someone else's work.

Misuse of Sources: When learners do not use proper citation protocols, they may inadvertently plagiarize another's work. Learners may cite the source material somewhere in the assignment, but it is not clear which passages are original and which are not (Braumoeller & Gaines, 2001). While this may be less critical in terms of academic honesty, the learner is not achieving learning objectives (*Defining and avoiding plagiarism*, 2003).

Uncritical Citing: Even when students use proper citation techniques and avoid plagiarism, they may still achieve limited learning outcomes when their work lacks analysis and synthesis of main ideas from the sources they are referencing.

Intertextuality: The term "intertextuality" can be used to describe an educationally productive process of building on or synthesizing others' ideas, and adding new perspectives or interpretations. The term was coined by Julia Kristeva in the context of literary analysis. She proposed that "any text is constructed of a mosaic of quotations; any text is the absorption and transformation of another...."(Kristeva, 1980). The dictionary definition of the term is: "Relating to or deriving meaning from the interdependent ways in which texts stand in relation to each other" (*American Heritage Dictionary*). The important principle here is that learners "derive meaning" from the sources they reference. Intertextuality, then, is a term that can be used to define practices whereby learners use other sources as a springboard for new connections, and derive meaning from the process.

Original Work: At the other end of the spectrum from plagiarism, learners create their own original work: new discoveries and innovations. Proper citations are used for any foundational ideas or arguments not original to the student (Braumoeller & Gaines, 2001).

MATCHING PROBLEM TO STRATEGY

The four most common strategies for combating plagiarism are: 1) enforcing academic honesty policies; 2) using electronic detection to identify plagiarized text; 3) instructing learners to use protocols for citation of sources; and 4) designing learning activities that cannot be easily copied from other sources. Comprehensive approaches integrate all four strategies through administrative and instructional policies and practices-- throughout the institution and within the classroom. All of the strategies are needed in combination, because each addresses particular issues in ways that are not interchangeable with the others.

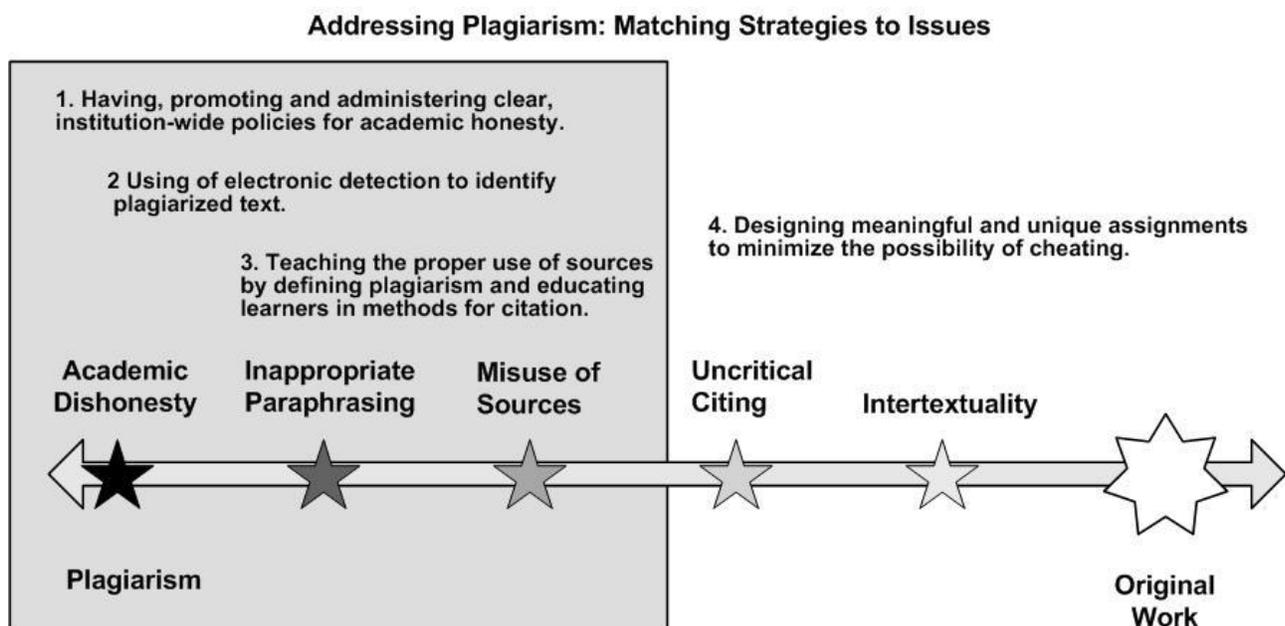


Figure 2. Appropriate Strategies

Academic honesty policies are needed to inform learners of the ethical and legal issues, and to clearly state implications for breaking the rules. But policies alone are not enough; instructors need detection tools so they can readily identify sections or entire papers drawn from other sources.

Teaching proper citation protocols and requiring submissions in academic style can help to prevent careless copying or adapting others' writings. If successful, such instruction can motivate learners to accomplish assignments using proper attributions. While positive in light of honesty and ethical practice, papers that draw on other sources with proper citations may still be inadequate in terms of the potential for learning from and building upon the ideas contained in resource materials.

The fourth strategy, designing learning activities that cannot be easily copied from other sources, is the focus of the rest of this chapter. As noted earlier, when learners represent others' ideas as their own, they are not developing their own ideas. The converse statement is equally important: when students develop their own ideas, they are not representing others' ideas as their own. Curriculum and teaching methods must support the goal of students developing their own ideas. Learner-centered pedagogical approaches help learners to develop critical thinking abilities, to contribute to fruitful collaborations, to give appropriate credit for others' contributions and to strive for originality. Educational taxonomies can help educators design and plan such learning activities.

TAXONOMIES: BLOOM AND COLLABORATIVE E-LEARNING

"A taxonomy is a system of categories or classifications that are used for purposes of organization, conceptualization, and communication" (Gilbert, 1992). Benjamin Bloom 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). Taxonomies can facilitate communication among educators by providing a common language for discussing ways to address various educational dilemmas.

Bloom's Taxonomies

The materials known as "Bloom's Taxonomy" are actually the product of a team of five researchers: Max Engelhart, Edward Furst, Walker Hill, David Krathwohl and Benjamin Bloom. In acknowledgement of the many ways people learn, they identified three domains: Cognitive, Affective and Psychomotor. The Cognitive and Affective Domains are relevant to the present study.

The *Taxonomy of Educational Objectives for the Cognitive Domain* is a framework that shows six levels of thinking, from knowledge through evaluation. The Taxonomy for the Cognitive Domain focuses on development of critical thinking skills, beginning with the ability to retain terminology and basic concepts of a subject, and moving toward the ability to use, critically evaluate, and ultimately improve upon the concepts through synthesis with new ideas (Bloom et al., 1956).

The *Taxonomy of Educational Objectives for the Affective Domain* is a framework that shows five levels of development of attitudes and values (Krathwohl, Bloom, & Masia, 1964). The Taxonomy for the Affective Domain begins by describing the ability to receive experiences or information, through the development of values, and the internalization of those values. At level five, behaviors are consistent with values.

Forty- five years after Bloom's team put together the Taxonomies, a group of people went through a similar process of meetings and discussions in an effort to update the work. Lorin Anderson, a former student of Bloom, and one of the original team members, David Krathwohl, led the revision team. The team was made up of experts from the fields of cognitive psychology, curriculum theory, and testing and assessment. The result of their work is published as A

Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom's Taxonomy of Educational Objectives (Anderson, Bloom, Krathwohl, & Airasian, 2000).

Bloom's Cognitive Taxonomy (1956)	Revised Taxonomy (2000)
Knowledge: <ul style="list-style-type: none"> Recall information; bring to mind the appropriate material. 	Remember <ul style="list-style-type: none"> Recognizing Recalling
Comprehension <ul style="list-style-type: none"> Understand what is being communicated; able to grasp the meaning of material presented. 	Understand <ul style="list-style-type: none"> Interpreting Exemplifying Classifying Summarizing Inferring Comparing Explaining
Application <ul style="list-style-type: none"> Use abstractions in particular and concrete situations. 	Apply <ul style="list-style-type: none"> Executing Implementing
Analysis <ul style="list-style-type: none"> Break down material into its constituent parts or elements; recognize organizational structure. 	Analyze <ul style="list-style-type: none"> Differentiating Organizing Attributing
Synthesis <ul style="list-style-type: none"> Assemble elements or parts to form a whole. 	Evaluate <ul style="list-style-type: none"> Checking Critiquing
Evaluation <ul style="list-style-type: none"> Make a judgment about the value of material or methods for a given purpose or situation. 	Create <ul style="list-style-type: none"> Generating Planning Producing

Table 1. Bloom's Taxonomy and Revision

The explanation of the "Knowledge" category in the original version states: "By knowledge, we mean that the student can give evidence that he remembers, either by recalling or by recognizing, some idea or phenomenon" (Bloom et al., 1956 p. 28). In the revision, the action of "remembering" is at the foundational level. The Taxonomy is described as two-dimensional

with a “Cognitive Process and “Knowledge Dimension.” The Cognitive Processes are organized from simple to complex, based on the assumption that to Remember requires a simpler cognitive process than to Apply. The Knowledge Dimension is organized from concrete to abstract. The Revision includes a new area, Metacognitive Knowledge, which reflects cognitive psychology findings made since the original Taxonomy. The term is used to describe two aspects: 1) knowledge about cognition and 2) control, monitoring, and regulation of cognitive processes. (Anderson et al., 2000)

Knowledge Dimensions
<p>Factual Knowledge: The basic elements that students must know to be acquainted with a discipline or solve problems in it.</p>
<p>Conceptual Knowledge: Interrelationships among the basic elements within a larger structure that enable them to function together.</p>
<p>Procedural Knowledge: How to do something; methods of inquiry, and criteria for using skills.</p>
<p>Metacognitive Knowledge: Knowledge of cognition in general as well as awareness and knowledge of one's own cognition.</p>

Table 2. Knowledge Dimensions in Bloom's Taxonomy Revision

Educators across disciplines and from K-12 through graduate level use Bloom’s Taxonomies for the Cognitive and Affective Domains. These educators want to do more than teach content, they also want to foster development of critical thinking skills. They 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. In the process, learners

develop the affective qualities and internalize and act on values that include academic honesty. These are precisely the skills that motivate learners to draw on the work of others constructively and to contribute their own value to an assignment rather than plagiarize.

COLLABORATIVE E-LEARNING

Bloom's Taxonomies provide useful frameworks for design of assignments that encourage individual learners to acquire critical thinking skills. The Taxonomy of Collaborative E-Learning offers a new conceptual framework for understanding levels of collaboration and for organizing assignments so that participants learn to work together and achieve unique collective outcomes. Learners must analyze each other's work and synthesize key ideas in order to produce outcomes that represent the diverse inputs of participants.

Collaborative learning can complement individual study and leverage the power of learner-learner interaction. Interaction is intrinsic to collaboration (Gray, 1989; D. 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; Vygotsky, 1978, 1987; Weil & Joyce, 1978).

Learners can benefit from purposeful collaboration, whether the class is taught online, face-to-face, or in a blended combination. Renard points out that educators can try vainly to make [students] do things the traditional way—or we can capitalize on digital technologies to help students learn and grow. We can find ways to combine the newer, faster technology with more traditional methods (Renard, 2005 p. 45) In an era where text-messaging, email and

blogging are common ways learners interact socially, collaborative e-learning encourages learners to apply these practices to educational tasks.

The Taxonomy of Collaborative E-Learning is grounded in the results of a qualitative study, which explored an in-depth view of instructors' perceptions of teaching with online collaborative methods, and descriptive examples of their approaches. Phenomenological research methodology provided a structured approach for inquiry into the perceptions of success factors for collaborative e-learning of a purposeful sample of twelve experienced online educators from five countries. Study findings were used to refine and build on the author's original model for the Taxonomy of Collaborative Learning.

For the purpose of this study, collaborative e-learning was defined 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.

"Mutual engagement" means all are participating in shared, reciprocal work. "Two or more learners" means these are activities that engage pairs or groups of learners. Others may also be a part of the collaborative e-learning activity including the instructor or those involved in an applied or service-learning projects. "Coordinated effort" means the project is purposeful and meshes with curricular goals. "Construct knowledge, negotiate meanings and/or solve problems" means learning together in meaningful ways that use and develop higher order thinking skills. "Internet and electronic communications" means learners use synchronous or asynchronous tools such as email, web conferencing, instant messaging, wikis or threaded discussion forums.

By this definition, while learners may complete parts of a project independently, when they integrate their efforts into one outcome, we can describe their work as "collaboration."

Collaboration provides opportunities for people to learn from each other or transfer knowledge. Together they can generate innovative new ideas or approaches, or new applications for best practices.

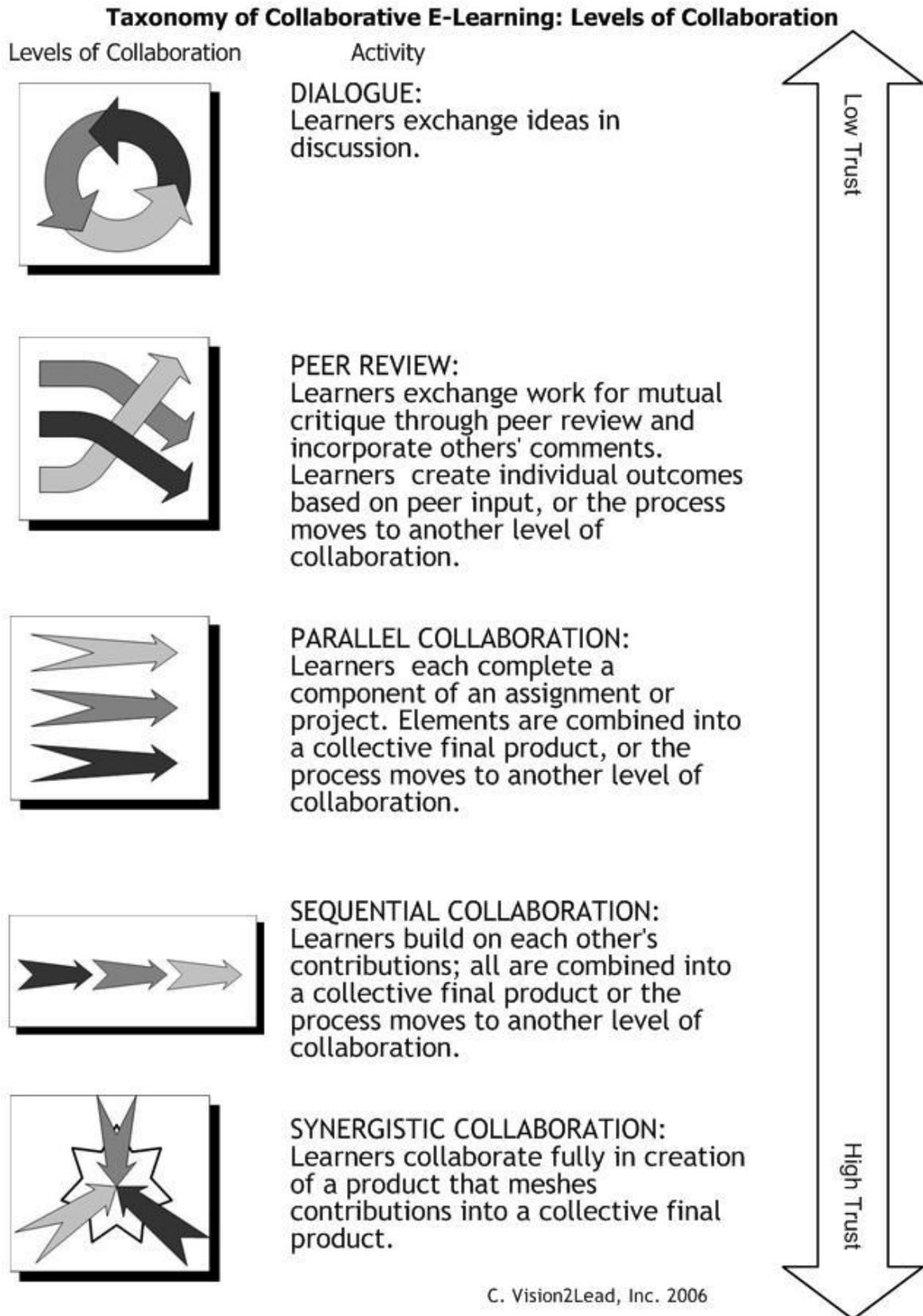


Figure 3. Salmons' Taxonomy of Collaborative E-Learning

Elements of the Taxonomy of Collaborative E-learning

The Taxonomy of Collaborative E- Learning contains three key elements: the Levels of Collaboration, Learning Activities and Trust Continuum.

1. Levels of Collaboration

Levels of Collaboration lists progressively more collaborative styles of working in a group. One level is not better than another in absolute terms, but one may be better than another in relation to the learning goals, the configuration or social stage of the group, timing or other issues. The five levels are: Dialogue, Peer Review, Parallel, Sequential and Synergistic Collaboration. Arrows in the diagrams represent process, and the stars represent outcomes.

Levels of Collaboration can be ordered or combined in various ways to organize multi-stage projects. In the process of completing projects organized with this system, participants can gain the skills needed to lead, organize and participate in collaborative projects.



Dialogue.

The foundational level of collaboration is Dialogue. This term is used to describe a shared, mutually-responsive discussion. Dialogic teaching draws from Socrates and Plato, who encouraged active learning through self-examination, intelligent dialogue and interactive communication. In *Discussion as a Way of Teaching*, Brookfield and Preskill define the purpose of dialogue to help learners: reach a more critically informed understanding of the topic, become more appreciative of diverse opinions, enhance learners' capacity for self-awareness and self-critique, and to act as a catalyst for action (Brookfield & Preskill, 2005). Philosopher Matthew

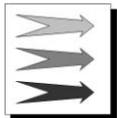
Lipman argues, "The skills needed for good thinking are bred by the dialogue itself. The dialogue elicits, draws out, the cognitive performances of the students." (Lipman, 1993 p. 10)

In the context of this model, Dialogue is a catalyst for collaboration, a means for learners to find coherence in the ideas, plans and/or tactics needed to coordinate their efforts. While Dialogue is a foundational step, it is assumed that it will be an essential part of any collaborative process at all stages.



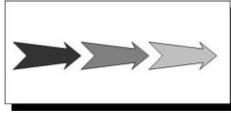
Peer Review.

The second level is Peer Review. This term is used to describe a process of critique and feedback between learners. Giving and receiving feedback allows learners to practice elements essential to leadership development—assessment, challenge and support (McCauley & Douglas, 2005). When Peer Review is structured with mutually acceptable boundaries and set criteria, learners can provide objective perspectives and learn from each other (Guthrie & King, 2004).



Parallel.

The third level is Parallel collaboration. When an assignment is completed by a group of learners using a Parallel structure, components of the assignment are allocated among learners. Parallel collaboration typically involves individual work and a process of Dialogue and Peer Review to integrate contributions into a final product.



Sequential.

The fourth level is Sequential collaboration. When an assignment is completed by a group of learners using a Sequential structure, components of the assignment are organized into a series of progressive steps and results are combined into one collective product. Each component depends on successful completion of another in the series of steps. Each step typically involves individual work and a process of Dialogue and Peer Review to integrate contributions into a final product.



Synergistic.

The fifth level is Synergistic collaboration. When a group of learners uses a Synergistic structure, they work together through all steps and synthesize their ideas to plan, organize and complete the assignment together. Their contributions are fully meshed into collective final product.

2. Learning Activity

The Learning Activity column includes simplified descriptions of the kinds of actions learners take in each corresponding level.

3. Continuum of trust

The continuum illustrates a relationship between trust and the level of collaboration. As illustrated here, as collaboration increases, so does the need for trust. Charles Handy observed the need for more attention to trust in the virtual world in his predictive article, "Trust and the Virtual Organization." He defined trust as "the confidence that a person is competent to reach a goal and is committed to reaching it," and observed that the practice of trust "implies reciprocal loyalty " (Handy, 1995 pp. 7-8). Collaboration means reliance on others' abilities and integrity, and confidence that the other learner(s) can and will share your commitment toward meeting the learning goal of the assignment. The reciprocal loyalties and common purpose among learners involves trust not only among the learners, but also between the instructor and the learners.

Instructional Approaches: Findings from the Collaborative E-Learning study

Research participants reported on the use of cognitive processes and multiple knowledge dimensions in each stage of the collaborative process. While Peer Review exchanges described in the data typically asked learners to organize and integrate information into a classification scheme provided in the assignment, activities conducted at the Parallel, Sequential or Synergistic levels usually required learners to create their own classification schemes and protocols for organizing, managing and integrating information from multiple inputs. To do so, they had to do more than discuss what to do; they had to think together about how to do it (London, 2005). At the Dialogue and Peer Review levels the focus was on communicating, and on giving and receiving constructive criticism. At the Parallel level, learners created agreements, developed

mutual accountability and dealt with under-performing team members. Kanter called this process learning to collaborate (Kanter, 1994).

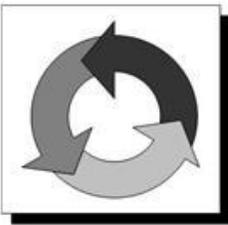
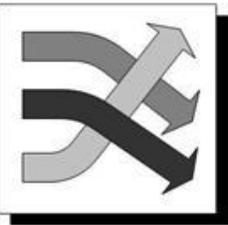
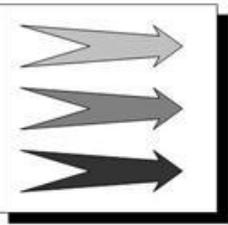
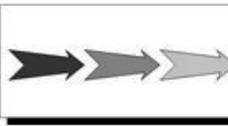
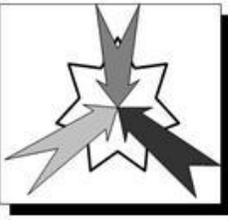
Nearly half of the research participants describe some kind of individual metacognitive, reflective process as part of the collaborative activity.

At the Parallel, Sequential and Synergistic levels, learners were typically engaged in activities that invited them to generate new information or knowledge by adapting and integrating multiple parts into a collective whole.

At the Sequential level, learners worked out ways to build shared commitment to a goal, and how to coordinate a multi-step process. For effective collaborative learning, there must be a balance between "group goals" and "individual accountability," with individual learning success as part of the group task (Slavin, 1989). At the Synergistic level they learned to interact with partners at all stages of the project. At these higher levels of collaboration they practiced participatory decision-making and learned to balance individual interests with group purpose.

Research participants described learning experiences that correspond to each level of the Taxonomy of Collaborative E-Learning. As instructors, research participants were actively involved in every step of the process. Research participants were in agreement that, regardless of the design and planning carried out prior to the class, there is no substitute for active involvement by instructors during the class.

**Taxonomy of Collaborative E-Learning:
Levels of Collaboration, Knowledge Dimension and Cognitive Process**

Levels of Collaboration	Cognitive Process	Knowledge Dimensions of Learning
 DIALOGUE	UNDERSTAND <ul style="list-style-type: none"> • Interpreting • Exemplifying • Summarizing • Inferring • Comparing • Explaining 	CONCEPTUAL KNOWLEDGE <ul style="list-style-type: none"> • Learners access relevant concepts and share them. PROCEDURAL KNOWLEDGE <ul style="list-style-type: none"> • Learners use synchronous or asynchronous online discussion or conferencing tools to communicate. • Learners participate in or facilitate online discussions; maintain focus on topic. METACOGNITIVE KNOWLEDGE <ul style="list-style-type: none"> • Learners reflect on own ideas and respect others' ideas.
 PEER REVIEW	UNDERSTAND <ul style="list-style-type: none"> • Classifying EVALUATE <ul style="list-style-type: none"> • Checking • Critiquing 	CONCEPTUAL KNOWLEDGE <ul style="list-style-type: none"> • Learners classify work by peers according to criteria. PROCEDURAL KNOWLEDGE <ul style="list-style-type: none"> • Learners determine when and how to use review procedures and honor boundaries. • Learners give constructive criticism. METACOGNITIVE KNOWLEDGE <ul style="list-style-type: none"> • Learners share strategic, contextual and/or conditional knowledge.
 PARALLEL	APPLY <ul style="list-style-type: none"> • Executing ANALYZE <ul style="list-style-type: none"> • Differentiating • Organizing CREATE <ul style="list-style-type: none"> • Planning 	CONCEPTUAL KNOWLEDGE <ul style="list-style-type: none"> • Learners determine shared goal or purpose. • Learners gain perspectives on intellectual property of own and others' work. PROCEDURAL KNOWLEDGE <ul style="list-style-type: none"> • Learners develop protocols for timing, communication. • Learners create agreements for combining individual contributions into collective work. METACOGNITIVE KNOWLEDGE <ul style="list-style-type: none"> • Learners determine how their skills fit group task.
 SEQUENTIAL	APPLY <ul style="list-style-type: none"> • Implementing EVALUATE <ul style="list-style-type: none"> • Checking • Critiquing CREATE <ul style="list-style-type: none"> • Producing 	CONCEPTUAL KNOWLEDGE <ul style="list-style-type: none"> • Learners create schemas for multi-step process. PROCEDURAL KNOWLEDGE <ul style="list-style-type: none"> • Learners coordinate and track progress. • Learners use quality control criteria to assess deliverables at each stage. METACOGNITIVE KNOWLEDGE <ul style="list-style-type: none"> • Learners reflect on personal goals and interests.
 SYNERGISTIC	ANALYZE <ul style="list-style-type: none"> • Attributing CREATE <ul style="list-style-type: none"> • Generating • Producing 	CONCEPTUAL KNOWLEDGE <ul style="list-style-type: none"> • Learners generate new knowledge and ideas. PROCEDURAL KNOWLEDGE <ul style="list-style-type: none"> • Learners interact at all stages of process. METACOGNITIVE KNOWLEDGE <ul style="list-style-type: none"> • Learners reflect on skills needed to collaborate. • Learners balance individual and group purpose and process.

Cognitive processes introduced at each level assume mastery of the skillsets from previous levels.

Figure 4. Salmons' and Bloom's Taxonomies

USING TAXONOMIES TO STRUCTURE MEANINGFUL ASSIGNMENTS

The following examples are drawn from the author's study on collaborative e-learning. They illustrate ways that instructors can adapt learning activities in an existing course or design activities for new course. These activities expect learners to interact with others in the class and the community, then to integrate multiple inputs into unique outcomes.

Example 1: Collaborative E-Learning in an Online Doctoral Course

The first example describes collaborative learning in an advanced quantitative research doctoral course: "Applied Multivariate Modeling." The design of this course includes two components that are typical for online courses: 1) A unit-by-unit discussion, which requires learners to answer questions and comment to other learners, and 2) A research paper or project completed by learners individually. In addition, the instructor added some creative elements by integrating opportunities for collaborative and original work.

Applied Multivariate Modeling is sequentially organized with a series of assignments throughout the twelve-week term and a final project. Assignments include individual work, group participation and collective work. The collaborative e-learning project for the course is creation of a *Decision Makers' Guide to Application of Multivariate Statistical Analysis* by the class.

For each of the Units 3 through 9, one or two learners in the class lead a discussion thread on pragmatic applications of a particular technique or techniques which were explored in a previous unit. These assigned learners each work individually to prepare for the discussion, then work together to construct proposed applications for the *Guidebook*. The whole class discusses the proposed applications. The outcomes of the discussions are the basis for the *Decision*

Makers' Guide to Application of Multivariate Statistical Analysis. So, this final product is crafted synergistically, with input from individual learners and from the class acting together.

Assignments for a mathematics course could consist of a series of problems to solve with each problem requiring a short answer that is either right or wrong. Such an assignment could be vulnerable to cheating. In this course, the instructor utilized several preventative practices to design multiple assignments that ask learners to make original contributions. The instructor created individualized tasks, instead of expecting all learners to fulfill the same requirements (Carroll & Appleton, 2001). The project—creation of a guidebook—asked the learners to explore real questions in the discipline (Procter, 2006). This kind of project asks learners to discuss their understanding of course material and relate it to life or professional experiences (McLafferty & Foust, 2004). The project expected learners to value the quantitative methods as essential decision-making tools in professional settings. The instructor assessed multiple kinds of assignments, including those that focused on process—facilitating class dialogue (Procter, 2006).

Learning activities in this course used multiple levels of collaboration. Learners alternated between individual preparation, Dialogue and Peer Review throughout the course, then worked Synergistically to create the final project deliverable. Learners were expected to use an intertextual approach to respectfully synthesize multiple perspectives. To accomplish these learning activities, learners used diverse cognitive processes and knowledge dimensions.

Understand: Learners construct meaning from instructional messages exchanged instructor-learner and learner-learner. They interpret and clarify quantitative research theories and models (Conceptual Knowledge). Learners summarize and explain techniques and procedures for an anticipated audience of practitioners who will use the *Guidebook* (Procedural Knowledge).

Apply: Learners applied multivariate statistical analysis to both familiar and unfamiliar tasks. (Procedural Knowledge).

Analyze: Learners differentiated and organized statistical analysis techniques for users of the *Guidebook*.

Evaluate: Learners checked and critiqued each other's work through Peer Review (Conceptual and Procedural Knowledge). Learners reflected on their own abilities to carry out complex statistical analyses (Metacognitive Knowledge).

Create: Learners planned and produced a collective outcome for the course, the Decision Makers' Guide to Application of Multivariate Statistical Analysis.

Example 2: Collaborative E-Learning in a Blended Learning Undergraduate Course

The second example describes collaborative learning in a blended undergraduate course: "Advanced Business Writing." Business writing is a topic area with high potential for blatant plagiarism, since the Internet is full of examples that could be adopted or adapted for assignments. In this example, the instructor created a course design that defies either purposeful or inadvertent plagiarism.

Advanced Writing for Business is designed not only to help learners write effectively in a business environment, but also to improve the ability to research and analyze complex ideas, to appreciate and develop the skill of effective argumentation, and to write clear, grammatical, well-structured communications. With some emphasis on ethics and issues of public concern, coursework is designed to increase learners' capacity to analyze audiences and tailor content and style to produce written presentations that communicate with confidence.

A semester-long field project with a local non-profit organization provides teams of learners with real-world application where learners craft memos, press releases, reports and other kinds of business writing. This sequentially organized project involves a series of incremental, inter-dependent steps throughout the semester. These steps include both individual writing and collective work in teams. Members work in parallel to research non-profit agencies as potential partners with whom to conduct the project. Learners have ongoing online and face-to-face dialogue about the research. Team members and instructor work synergistically to accomplish several key steps: determine their criteria, select a non-profit agency setting, and develop interview questions to ask the agency staff in order to assess the needs. After developing an internal proposal memo to communicate decisions and plans to the agency and the instructor, learners comment on at least one other team memo (via the weblog) and choose the best one. The final report is crafted synergistically, using deliverables created individually and collectively, and presented to the agency and the instructor.

The structure of Advanced Writing for Business and the organization of learning activities throughout the term demonstrate high expectations for learners. It would not be possible to use the more blatant forms of plagiarism, since a paper of this kind could not be copied or bought.

The instructor used a number of recognized preventive strategies. Instead of asking for one big paper at the end of the term, she broke the assignment into parts with discrete deadlines (McLafferty & Foust, 2004; Sterngold, 2004). By reviewing work throughout the process, the instructor became familiar with the writing styles and of her students, so she would be sensitive to student writing, style, and content that is out of character. (Thomas, 2004 p. 428) The nature of the assignment compelled students to analyze and integrate data from multiple sources (Sterngold, 2004 p. 18). The collaborative process included ongoing peer review, which serves a

preventative purpose since students are often tougher on cheaters than instructors (B. Martin, 1992). She discussed research with learners in required meetings to converse about findings (Sterngold, 2004 p. 18).

Learning activities in this course used all levels of collaboration and encouraged learners to use higher order cognitive processes and multiple knowledge dimensions. Learners exchanged, reviewed, analyzed and reflect on each other's writing. They developed affective qualities through dialogue about ethical issues and values with their respective non-profit partners. The final team deliverable was an intertextual synthesis of learners' research, interviews, fieldwork, and discussions with the instructor. To accomplish these learning activities, learners used diverse cognitive processes and knowledge dimensions.

Understand: Learners construct meaning from instructional messages exchanged instructor-learner, learner-learner and learner-field placement supervisor. They infer and summarize communications needs in the field placement settings (Factual and Conceptual Knowledge). Learners determine criteria to use to determine when to use appropriate business writing approaches (Procedural Knowledge).

Apply: Learners applied business writing strategies to both familiar and unfamiliar tasks (Procedural Knowledge).

Analyze: Learners distinguish between various communication needs in the field placement agency to determine a project focus; learners organize their collaborative writing work. (Conceptual and Procedural Knowledge).

Evaluate: Learners check and critique each other's work through Peer Review (Conceptual and Procedural Knowledge). Learners reflect on their own writing and collaboration skills (Metacognitive Knowledge).

Create: Learners plan and produce collective outcomes for the course in the form of business materials tailored to the needs of their respective field placements.

SUMMARY: USING TAXONOMIES TO STRUCTURE MEANINGFUL ASSIGNMENTS

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. When an educator creates a learning experience with the Taxonomy of Collaborative E-Learning as a guide, learners are encouraged to pursue three goals through that experience: acquiring competencies in the content area, skills in team and group process, and proficiency with Internet and communications technologies (ICT).

Next Steps

The author's study supports the conclusion that the Taxonomy of Collaborative E-Learning is useful for expressing patterns of instructional design and pedagogy that have proven effective in practice. The research of others cited in this article makes it clear that collaborative practices that the taxonomy are designed to foster increase the original contributions of learners and reduce plagiarism. This strongly suggests that research to directly evaluate the relationship between using the taxonomy and reducing plagiarism would be fruitful.

Recommendations for faculty development generated from the author's study include:

1. Allow curricular and instructional flexibility, so instructors can adopt learner-centered approaches to respond to the characteristics and needs of their students.
2. Offer classes or workshops for faculty through the same course management platform and features that the learners use. Instructors can benefit from the experience as a 21 century learner.
3. Encourage peer learning among faculty. This recommendation corresponds to Reilly's findings that show advantages for having experienced "faculty peers" conduct workshops to show how to utilize new pedagogies and new technologies in the context of their shared discipline, instead of workshops by technology trainers (Reilly, 2005).
4. Fund and encourage faculty to participate in online conferences or events where they can interact with other educators. Faculty will benefit from the experience of diverse online interactions, as well as from the exchange of ideas and practices with others.

Sterngold echoed the recommendation for increased faculty development—and preparation of the next generation of faculty members.

Persuading professors to use the kinds of learning-centered practices that deter plagiarism will require major changes in faculty development,

evaluation and promotion systems, so that instructors are trained and rewarded for adopting these methods. Accelerating the shift from an instruction-based to a learning centered paradigm will also require changes in how we train and prepare doctoral students for academic careers. (Sterngold, 2004 p.21)

CONCLUSIONS

The proposals here are aimed not to 'stamp out' plagiarism but rather to create the sort of educational environment where it is rare because both students and staff expect the highest standards in each other. The aim should be to develop a culture of respect for quality work. (B. Martin, 1992)

This chapter focused on two inter-related ways to create the educational environment and culture described by Martin. One is to teach with a learner-centered pedagogy. Learner-centered pedagogy offers learners the opportunity and encouragement to create meaningful, unique assignments. The other is to teach with purposeful awareness of the information-rich online world. Kraus asks us to consider "what happens when students learn to use--in contrast to misuse--the web. The more they prepare legitimate material to post on-line, the more they participate in the largest collective intellectual undertaking in the history of the world (Kraus, 2002)." When learners use the web to research and/or conduct collaborative projects they can make respectful use of diverse resources through intertextual synthesis of others' work and their own. By using Bloom's Taxonomy in conjunction with the Taxonomy of Collaborative E-Learning, educators can create assignments that encourage learners to use online interactions and information as the springboard for their own original work.

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