Chapter 6

Constructivist Pedagogical Applications: Student-Centered Learning Across the Undergraduate Curriculum

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Constructivist educational theory, a leading conceptual model in higher education for the past three decades, is a student-centered approach that views learners as "architects of knowledge" who formulate their own conceptual frameworks on the basis of their learning histories, life experiences, and potentialities for discovery (Mayo, 2001a). In a constructivist model, students internally hypothesize and investigate problems as they discover solutions for themselves (Perkins, 1999). From a sociocultural viewpoint, this model also views learners as social beings who co-construct knowledge in dialogue with others (Phillips, 1995).

Over the past decade, I have undertaken an active research program to examine the efficacy of constructivist-based pedagogy in various undergraduate psychology classes. I have systematically compared parallel classes (constructivist vs. conventional pedagogy), while attempting to establish controls and equivalency across conditions. Moreover, I have analyzed my findings through both quantitative and qualitative assessments. Overall, I have observed that constructivism compares favorably to more traditional approaches, including straight lecturing and assigning term papers.

In this essay, I provide an overview of a range of constructivist pedagogical applications that I have grouped into four broad, umbrella categories. Based on my own classroom research and practice, I have found that these teaching applications lead to more active and interactive learning and reflective thinking beyond the borders of the classroom environment (Mayo, in preparation).

1. Using personal narratives to gauge authentic learning

Authentic learning is a performance-based measure of learning that mimics real-life scenarios (Mueller, 2003). *Personal narratives* are useful tools for students in applying course principles to real-world settings.

In *autobiographical narration*, learners directly apply course content to personal experiences. As an example of a term-length autobiographical assignment, I use the *Life Analysis* (Mayo, 2001b) in teaching lifespan developmental psychology. In the Life Analysis, each student is asked to analyze his or her life over its historical and hypothetical span, relating developmental milestones to salient concepts in developmental psychology. For the developmental periods that have passed, I ask students to chronicle the events that have been significant in their development. For the stages in their development that have yet to arrive, I ask students to write about anticipated life successes and disappointments.

In *biographical narration*, students apply course principles to the lives of others, current events, and the printed and electronic media. For instance, I use the *Observational Diary* (Mayo, 2003) as a term-length, case-based, journal writing assignment in teaching introductory psychology. Students keep an ongoing log of the times that they observe basic psychology in action. Diary entries consist of the date, source (e.g., home, work, movie), case description, and psychological application. Each case description serves as a vignette, or brief portrayal of some life experience, that allows students the opportunity to exemplify, analyze, and apply psychological concepts.

Case-based instruction (CBI) is another personal narrative strategy that brings important course concepts to life. On the heels of a successful pilot study (Mayo, 2002a) in which I used class discussion of an instructor-created, fictional case narrative to help students to apply contemporary psychological perspectives (biological, psychodynamic, behavioral, humanistic, cognitive, and cross-cultural) in real-life scenarios, I went on to structure an entire psychology of adjustment class around CBI (Mayo, 2004a). During class, students apply course principles to actual biographical case narratives (e.g., the life of Ronald Reagan as it relates to developmental transitions over the life cycle). Afterward, students write a series of "mini-autobiographical narratives" in applying these same principles in their own lives.

2. Helping students organize information through graphic representations

Concept mapping is a learning device that allows students to organize and represent networks of concepts in a diagram resembling a hierarchical flow chart (Wandersee, 1990). In constructing a concept map, the most inclusive, general concept appears at the top and links to more specific, subordinate concepts are listed hierarchically below. The uni- or bi-directional links between subordinate concepts depict a learner's understanding of the interrelationships between domains of knowledge (Novak, 1991). I have co-designed a classroom training guide for my students to create concept maps as both objects of class discussion and organizational study tools (Mayo & Salata, 2002; Mayo, 2005). I often use CmapTools (Institute for Human and Machine Cognition, 2008) as a cost-free, downloadable, and user-friendly software toolkit that allows my students to construct, share, and critique their concept maps.

An innovative graphic representational strategy that I have found to be effective in my classes highlights basic meaning dimensions in line with Kelly's (1955) personal construct theory. Kelly defined personal constructs as bipolar meaning dimensions (e.g., easy-difficult) that each person employs to understand and interpret information. Drawing both from meaning dimensions embodied in the thematic content of textbooks and from my own self-generated bipolar constructs, I use personal construct theory to facilitate learning in both lifespan developmental psychology and history and systems of psychology classes. As an instrument for exploring the personal constructs of my students, I rely on the *repertory grid technique* (Mayo, 2004b, 2004c, in press). Although the repertory grid exists in various formats, one that I have found particularly useful involves a rating grid in which students rate each element (e.g., a prominent theorist such as Sigmund Freud) on a series of Likert-type scales anchored by two construct poles (e.g., nature-nurture, mind-body, objective-subjective). *WebGrid III* (Gaines & Shaw, 2005) is a cost-free, easy-to-use, online computer program for grid elicitation and interpretation that I use with my students. After creating repertory grids, *WebGrid III* allows users to generate

a comprehensive data matrix from which both cluster and principal-components analyses are possible.

3. Encouraging higher-order thinking, active participation, and cooperative learning

In the *dialogue method*, students are perceived as "meaning-makers" who reflect on the shaping powers of language as a heuristic tool (Sanzenbacher, 1997). Dialogue consists of position statements in the form of direct or translated quotations from original sources as well as paraphrased excerpts from secondary sources. In teaching history and systems of psychology (Mayo, 2002b), I select statements that represent the philosophical or theoretical views of leading contributors to the historical evolution of psychology. Both individually in writing and subsequently as a group during class discussions, I instruct students to identify the contributor(s) to psychology most closely associated with each position statement without telling them in advance the identity of any given contributor. Moreover, I require students to provide supporting rationale for each of their answers, pushing them to analyze and comment on the intellectual stance captured in each statement.

Peer critique is another classroom approach that stresses the cooperative nature of learning. As an example, I use the *Colleague Swap* (Mayo, 2006a) to improve the quality of student writing in my classes. In this technique, students earn grade-applicable credit by exchanging writing assignments with three to five of their classmates. Throughout this process, students evaluate, proofread, and critique one another's work before submitting the final product to the instructor for grading. General guidelines governing peer critique of student papers take into account the following questions: (a) Does the introduction properly launch a connecting thread of ideas?; (b) Does the summary effectively recap the main points?; (c) Do the second, third, and following sentences in each paragraph follow closely from the opening sentence?; (d) Are relevant ideas expressed accurately, completely, and coherently?; and (e) Are all grammatical, spelling, and other mechanical errors eliminated?

In addition to asking peer evaluators to incorporate their suggested revisions directly into the body of the writing assignment, I use a pre-printed *evaluation ticket*, which is a checklist of standard rhetorical, contextual, and bibliographic considerations, to help evaluators organize and present summative comments to their classmates. Points are assigned to each subheading on the checklist, and room is provided for writing constructive criticism related to that item. The contents of the evaluation ticket can be modified to conform to the idiosyncratic needs of the course and the nature of the writing assignment involved.

4. Using advance organizers to build on what students already know

Advance organizers bridge the gap between what learners already know and what they need to know (Ausubel, 1960). *Analogical reasoning* serves as an advance organizer for students who must first visualize and personalize concepts before internalizing and applying them (Ausubel, 1977).

In my own classroom research and practice (Mayo, 2001c), I have found that analogy-enhanced instruction engenders its most favorable learning outcomes in cases where students are actively co-constructing analogies, involving opportunities for peer critique and facilitating instructor feedback. Accordingly, I have developed the *GEM Model of Analogy Co-construction* (Mayo, 2004d) that asks students to: (a) *G*enerate original analogies for course principles; (b) *E*valuate these analogies in

accordance with constructive feedback from their classmates and instructor; and (c) *M*odify their initial self-generated analogies in light of others' appraisals. As recorded in a cumulative journal that I call an *Analogies Log* (Mayo, 2006b), students evidence "a continual refinement and synthesis of fragmented, incomplete knowledge" (Wong, 1993a, pp. 1259-1260).

I often attempt to draw my students into the dynamics of learning through the following analogy-based classroom activities (Mayo, 2004e), arranged in ascending order of complexity:

Filling in the blanks. Begin by offering a partial analogy to the class (e.g., "The human brain in like ... because ...."). Afterward, allow students the chance to fill in the blanks as part of class discussion.

Object association. Hold up an object in class (e.g., etch-a-sketch). Then, ask students to brainstorm the ways in which the object is similar and dissimilar to the concept being covered (e.g., *tabula rasa*). For example, you can write on an etch-a-sketch in the same way that life experiences compose the story of our developmental history. However, unlike the etch-a-sketch that can be shaken clean at will, the positive and negative effects of these life experiences are cumulative in determining the course of our development.

Personalizing an analogy. Using the name of a well-known person relevant to course content (e.g., B. F. Skinner), ask students to imagine that they actually *are* that person in the conduct of his or her work. Probe students on how they might feel being that person relative to his or her contributions to the field (e.g., "If I was B. F. Skinner, I would feel like ... because ....").

Free association. Submit a term (e.g., stream of consciousness) or a short list of terms (e.g., unconscious, modeling, free will, association, heredity, mental activities, reward, social interaction) to the class. Then, ask students to generate other words that they associate with the target expression(s). Require students to provide supporting justifications for their responses. In doing so, encourage other students to critique the responses of their classmates to clarify any tenuous connections.

Conclusion

Constructivist approaches to teaching and learning, such as personal narratives, concept mapping, and analogical reasoning, stimulate abstract reasoning about underlying learning principles that permits students "a rare opportunity to problem find, as opposed to simply problem solve" (Wong, 1993b, p. 377). Students hold the potential to construct and co-construct knowledge in conjunction with peer input and guidance from the instructor. Consequently, students should be encouraged to play an increasingly active and interactive role in learning as an ongoing generative process.

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