

A Baker's Dozen Ideas to Foster Engagement

(James L. Cooper, Graduate Education Department, California State University, Dominguez Hills; in Exchanges: *The Online Journal of Teaching and Learning* <http://www.exchangesjournal.org> December 8, 2006) Adapted from a keynote address of the 9th Annual California State University (CSU) Symposium on University Teaching, April 1, 2006. ©2006 by James L. Cooper. Reprinted with permission.

I wanted to present a set of ideas that support faculty and administrators in fostering student engagement, and to have participants reflect on these and other ideas that they may wish to consider in engaging their students in and out of the classroom.

The ideas I presented are research findings, course/program interventions, and other resources that I have found powerful in fostering engagement over the years.

Idea #1:

What Matters in College? Four Critical Years Revisited (Astin, 1997)

This classic text in the teaching and learning field examines over 25,000 students and over 190 environmental variables that affected student cognitive and affective variables. Curriculum played little role in student success. It was student involvement, fostered by student/student interaction and student/faculty interaction that predicted student success. These findings should guide course and program planning. Alexander Astin's findings influenced many in higher education, including the National Study of Student Engagement group. (See also Pascarella and Terenzini, 2005, *How College Affects Students: A Third Decade of Research* for a review of thousands of studies published since their 1991 volume of the same name).

Idea #2:

National Study of Student Engagement (NSSE)

NSSE (pronounced "Nessie") assessed variables associated with student engagement. Indiana University's George Kuh and his colleagues identified five research based principles (including student-faculty interaction and active/collaborative learning) that predicted higher levels of student engagement.

NSSE data collection at CSUDH resulted in a five-year engagement plan focusing on these two variables. Some elements of the CSUDH Engagement plan are listed below.

- * Focusing faculty forum brown-bag sessions on engagement.
- * Implementation of first-year-faculty seminars that include interactive teaching strategies.
- * Revitalization of freshman success seminar including research based exercises/pedagogy.
- * Provost's Speakers Seminars, an outside speaker series (V. Tinto, T. Angelo, S. Kagan, C. Nelson, B. Millis) and other faculty development events tied to the theme "On Becoming an Engaged Community of Learners."

For streaming videos of these speakers, visit CSUDH's Center for Teaching and Learning website (<http://ctl.csudh.edu/SpeakerSeries/Archive.htm>). NSSE findings on the mismatch between student time spent preparing for class versus faculty expectations for course success suggest that student time in class must be spent wisely, since interaction with the content may be minimal outside of class.

Idea #3:

Science, Mathematics, Engineering and Technology (SMET) Research

Work by Eric Mazur (Physics, Harvard), Richard Hake (Physics, Indiana), Philip Treisman

(Mathematics, Berkeley), Leonard Springer (SMET, Wisconsin-Madison) and others documented powerful effects of group/interactive instruction on:

- * General academic achievement in SMET.
- * Higher order thinking in SMET.
- * Higher percentage of minority students succeeding in "gatekeeper" math/science classes.
- * Retention in math-based majors and in college, and other cognitive and affective measures.
- * To have long-term effects on student success, courses must move away from excessive reliance on lecture method and move toward more interactive instructional procedures See Interactive Lecture article by Cooper, Robinson and Ball (2000a) at Exchanges website (http://www.exchangesjournal.org/viewpoints/1161_Cooper.html).

Idea #4:

Women's Ways of Knowing Research/Theory/Constructivist Pedagogies

William Perry suggests that most students entering college are dualistic thinkers who prefer the lecture method to settle complicated conceptual tasks. The mismatch between professors and students in levels of cognitive maturity yields a low level of student success. Women's Ways authors Mary Belenky et al. suggest that preferred methods of knowing/learning for many students may be cooperative rather than competitive (e.g., grading on curve), and group/active learning rather than lecture. Lev Vygotsky indicates students learn best from other students in more proximal stages of development.

This work suggests less grading on curve, more criterion referenced grading, less lecture, and more cooperative, group learning.

Idea #5:

Mastery Learning/Keller Plan/Individualized Instruction

Personalized Instruction is a structured approach to teaching in which the instructor analyses the important skills in a class and creates a learning environment characterized by mastery learning, where students are required to demonstrate that they have learned earlier skills before moving on to more complicated ones. Pascarella and Terenzini (2005) report that this system of teaching results in a 19-percentile advantage in learning outcomes when compared to more conventional approaches. Thus, a group of students taught conventionally who scored in the 50th percentile might be expected to score in the 69th when taught using a mastery learning approach. The researchers report an effect size of .41 and .68 (considered moderate effect sizes) in two meta-analyses conducted on this approach.

The studies suggest that instructors focus on a limited number of "big ideas," then ensure that students have learned the limited number of related skills by frequent informal Classroom Assessment Techniques (CATs) and criterion referenced testing, versus teaching the entire textbook content and grading on the curve.

Idea #6:

Learning Communities

This idea frequently includes block scheduling of classes and registration, such that students take the same two or three classes, often thematically linked. Vincent Tinto reports that Learning Communities have a statistically significant impact on student persistence to graduation. Johnson, Johnson and Smith (1998) and others report that such learning communities result in a sense of "educational citizenship" (a sense of responsibility for others' learning), greater involvement in classroom learning, and perception of greater academic achievement.

Pascarella and Terenzini (2005) caution that research on learning communities is "nascent" and "mixed" when applied to learning outcomes. The power of learning communities, particularly when combined with cooperative/collaborative learning, is to foster the kinds of student/student and student/faculty interaction that Astin finds the surest predictors of college student success.

This idea represents a promising area for additional research.

Careful planning of both curriculum and pedagogy around a limited number of central thematic constructs, and pedagogy stressing interactive learning has great potential to encourage student achievement, persistence to graduation, educational citizenship, and other cognitive and affective outcomes.

**Idea #7:
Research on Teacher Variables**

There has been some good research on the characteristics of effective teachers. Pascarella and Terenzini (2005) report, "The two most salient dimensions of teacher behavior in predicting student learning were instructor skill (particularly clarity of presentation) and course structure/organization (such as class time structured and efficiently organized) both of which are learnable skills." Cooper and Cuseo (1988) asked CSU students, faculty and administrators the teaching behaviors that characterized their most effective teachers. The number one characteristic on all three lists was "a clear and detailed syllabus," one way in which teachers can demonstrate clarity and organization. It is worth noting that expressiveness/enthusiasm is also strongly correlated with student success.

**Idea #8:
Deep Learning/Critical Thinking/Significant Learning**

Research and theory by such researchers as Joanne Kurfiss, Richard Paul, Dean Fink, Spencer Kagan, Alexander Astin, Richard Hake, Eric Mazur and Diane Halpern suggest that interactive instruction and constructivist/feminist pedagogy are correlated with increases in critical/higher order thinking. Research is hampered by the lack of a clear definition of constructs (critical thinking/higher order thinking, etc.).

Regardless of the theorist/researcher, recommendations for practice include interactive teaching intentionally focused on practice regarding higher order thinking, particularly involving writing. NSSE research suggests that many students do little writing in their undergraduate classes.

**Idea #9:
Cognitive Scaffolding**

Cognitive scaffolds are forms of support provided by the teacher (or another student) to help bridge the gap between students' current abilities and the intended instructional goal. Examples of scaffolds are such concepts as Anticipate Student Errors, Partial Solutions and Think Alouds (Cooper, Robinson and Ball, 2003a).

Scaffolds can be inserted in lectures and other instructional formats to more actively engage learners. For example, after lecturing on independent and dependent variables, an instructor may give the class a word problem containing one of each, then say, "In educational research, the independent variable is usually a student characteristic or school-based experience, so it seems that the type of reading program is the independent variable in this problem. The dependent variable is often some student outcome, so in this problem, it seems to be the reading scores measured at the end of the school year." Think Alouds provide students with examples of how experts solve problems, thus modeling higher order thinking skills, before asking students to demonstrate these skills on tests and papers. Research suggests that students need many practice opportunities (10-20 or more) to reach automaticity, or fluency.

**Idea #10:
Cooperative/Collaborative/Group Learning**

According to Ellis (2001), "Cooperative learning is one of the most durable, if not the most

lasting, educational innovations of our time." Johnson, Johnson and Stanne (2000) reported a large number of studies had been conducted comparing cooperative approaches with other procedures. Wilbert McKeachie, in his landmark text *McKeachie's Teaching Tips* (2006) notes that "There is a wealth of evidence that peer learning and teaching is extremely effective for a wide range of goals, content and students of different levels and personalities." He adds, "The best answer to the question: What is the most effective method of teaching? is that it depends on the goal, the student, the content and the teacher. But the next best answer may be students teaching other students."

Spencer Kagan (2006) noted that there were hundreds of specific cooperative strategies, ranging from informal Think-Pair-Share procedures to more formal techniques such as Group Investigation (see Cooper, Robinson and Ball, 2003b). Many practitioners are moving to informal, turn-to-a-neighbor methods to alleviate problems such as the dominator/freeloader effect (wherein one or two people do most of the work while others do little or nothing for the same group grade) associated with more formal procedures.

Idea #11:

Classroom Assessments (CATs)/ConceptTests/Quick-Thinks

Brief, active-learning exercises can be inserted in lectures or other instructional formats to require students to process information individually and/or collaboratively. Examples of these procedures include Paraphrase the Idea, Correct the Error and Reorder the Steps. Perhaps the best-known procedure is the Minute Paper, popularized by Cross and Angelo, where students are asked to briefly note the most important thing they learned in the class and what question(s) remain unanswered, usually completed at the end of a class meeting. The instructor reads these responses (usually this takes just a few minutes), then addresses any resulting issues at the start of the next meeting. My colleague Susan Johnston suggests that faculty review their lecture and other notes and insert one of these CATs at appropriate intervals (e.g., every 15-20 minutes).

Idea #12:

Cognitive Science/Learning Science Research

This area is perhaps the most exciting recent development in teaching and learning. Diane Halpern, formerly at CSU San Bernardino (currently at Claremont McKenna College) is a leader in this field. Perhaps the most influential recent work in this area is the 2000 book *How People Learn: Brain, Mind, Experience, and School* by John Bransford and his colleagues.

Most people can only hold about seven "bits" of memory in short term memory, the kind we use when an operator tells us a phone number we need immediately in order to make a call. If we add more information to this memory, as is often the case in very dense lectures, virtually all information is lost. We also know that even highly motivated students can pay attention to technical material only for 10 to 20 minutes. This finding suggests that we break lectures and other presentations into manageable amounts of information, frequently inserting scaffolds, CATs and other active and cooperative strategies into an otherwise passive mode of processing/storing information.

Idea #13:

Study Groups/Networks/Scholarship of Teaching and Learning

Teachers, like students, need peer group support. Many find teaching a stressful, isolating experience but feel that seeking help is a sign of weakness and may reflect poorly on them in the retention, promotion and tenure process. One way teachers can receive support is to form brown-bag networks of colleagues who might meet once or twice a month to discuss issues and challenges in teaching.

A more formal procedure is to form a group focusing on the Scholarship of Teaching and Learning (SoTL). SoTL is an attempt to bring the rigor that faculty apply to their basic research to an examination of their teaching. Most of the national organizations within each disciplinary area

have Teaching of (Psychology, Physics, etc.) interest groups that may include a web site. Faculty can network with these groups online or at meetings. Presentation and publication on the Scholarship of Teaching and Learning are increasingly being accepted for promotion and tenure in the CSU. Such groups can develop "scholarly teaching" (teaching informed by research/theory such as I have described here). Publication/conference presentation responsibilities, including SoTL work, can be shared with colleagues to diminish the workload.

For Further Study

Marzano et al. (2001), a meta-analysis of instructional strategies, offers many ideas worthy of exploration. There are also numerous websites relating to the topics identified here. For example, the Carnegie Foundation has one on SoTL. Good websites on group learning are Rich Felder's at N.C. State and Spencer Kagan's. Evergreen State's website includes a national resource center for learning communities. Some of these websites have links to others addressing issues covered here, and many of the articles and reviews to be found right here in Exchanges offer valuable information on these same concepts.

The foregoing list of ideas and resources is not inclusive. Service learning, technology, general education issues, student success courses, student diversity, and other topics aren't treated, although, for example, many studies have shown that cooperative learning and other interventions described above foster appreciation of diversity and other student success outcomes. On the next page, please note your experience with these and other issues and how successful you have been in engaging students.

NOTE

Symposium participants at the "Baker's Dozen" presentation were provided with a reflective exercise handout to note their experience with these and other issues in engaging students.

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classrooms more engaging and give teachers timely feedback regarding their performance. See also 1998 updated volume edited by Angelo: Classroom assessment and research: An update on uses, approaches, and research findings: New Directions for Teaching and Learning, No. 75, also from Jossey-Bass.

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