



Becoming an Effective Teacher Using Cooperative Learning: A Personal Odyssey

► **Barbara J. Millis**, director, Teaching and Learning Center, University of Texas–San Antonio

Unlike the other contributors in this issue, I would like to take a more reflective approach to what constitutes effective teaching based on my twenty-seven years in faculty development and, perhaps more pointedly, based on my own evolving journey in the classroom. I am encouraged to take this approach by William Zinsser's (2009) recent article about his own odyssey as a writer. He states, "The best teachers of a craft, I saw, are their own best textbook. Students who take their classes really want to know how they do what they do—how they grew into their knowledge and learned from wrong turns" (62-63). My own experience and the literature confirm that most good teachers do not leap like Athena, full-grown from Zeus's head. Learning to teach "wisely and well" takes time. Most of us do not offer award-winning presentations our first day in the classroom. Learning to teach is often a slow and painful experience with skills, values, and beliefs (summarized eloquently by Miller in this issue) developing incrementally, often unconsciously. That kind of progress is difficult to document because we are often unaware of our progress which is, like the tortoise's, slow and steady, but unremarkable. What I prefer to focus on instead are "aha moments," "epiphanies," or "breakthroughs." The name isn't important. The important thing is that they happen, and that they can and do transform a person's teaching.

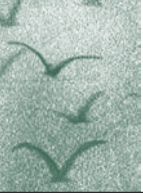
THE FIRST BREAKTHROUGH—COOPERATIVE LEARNING

For me, my first breakthrough in teaching occurred in the late 1980s when I attended a three-hour workshop by Neil Davidson at the University of Maryland that I had organized because someone told me he was "good with groups." I had been teaching for roughly twenty years (hard to confess!) using the only models I knew: lecture and whole-class discussion. I rarely used group work, even

though I am a literature/composition teacher who had been trained to use peer critiquing methods, because as a student I had only seen the "darker side" of group work. As an undergraduate student in the 1960s at Florida State University, we knew that the only reason a professor told us to "Get into groups and 'groove'" was due to his lack of preparation. We sat in groups with no direction or purpose, often while the professor wandered out of the room in search of a "cuppa java," and what occurred can only be described as "yadda, yadda, yadda," even though that term hadn't been invented yet.

What Davidson showed me and others was a different approach to group work called cooperative learning (Cooper, Robinson, and Ball 1993; Kagan 1989; Johnson, Johnson, and Smith 1991; Millis 2002; Millis and Cottell 1998; Slavin 1986). In a nutshell, cooperative learning is a highly structured form of group work that focuses on the problem-solving that Bain and Zimmerman (this issue) suggest can lead students—when directed by a good teacher—to deep learning and genuine paradigm shifts in their thinking. Two "givens" in the cooperative learning literature are positive interdependence and individual accountability. Positive interdependence means that you give students a vested reason to work together on a task, usually through the nature and structure of a task designed to encourage cooperation to face challenges that a single student could not meet. Individual accountability means that students receive the grades they earn. In cooperative learning classrooms, students can be graded on their own homework submissions, papers, and exams. Individual accountability is especially important with group projects to prevent "free loading" or "social loafing." Usually this requires peer and self-critiquing.

"Group processing" is also essential: both you and the students pay attention to group dynamics and productivity. Leadership



skills help students learn how to lead an effective meeting, drawing contributions from all group members, making certain that everyone's ideas are heard and treated respectfully, and drawing out reluctant contributors.

Although it is not a “given” in the cooperative learning literature, I am passionately committed to heterogeneous teams that take into account factors such as majors, grade point averages, gender, ethnicity, and age. Thus, instructors need to select the groups. Four people can remain together for a semester in large classes or be regrouped at the midterm point in smaller classes. Instructor-selected, diverse groups increase the likelihood that students will face challenges to their assumptions and the diverse approaches to problem-solving needed for critical thinking. Students also learn to work with people unlike themselves, an important workplace skill.

I had anecdotal evidence that a dynamic classroom “community” focused on student learning resulted from the group interactions

As I took workshops from Spencer Kagan and David and Roger Johnson and read prodigiously, I introduced classroom management tools into my classroom, such as a raised hand to bring the class back to attention (the quiet signal) and “sponge” or “extension” activities for fast-working groups. Probably my most radical change was using group folders and playing cards. This approach can transform large classes with hundreds of students by making every team accountable for completing in-class assignments and by making any individual accountable for the group report. In a class of approximately 150, for example, the first fifty-two students, in teams of four, receive

red folders; the next fifty-two students, blue folders; and the next fifty-two students, yellow folders. The team folders, labeled Aces through Kings, contain four matching cards with the different suits—hearts, diamonds, clubs, and spades. Thus, any student can be called on to give a team report by the “luck of the draw.” The teacher announces the color of the folder and draws a card such as the three of hearts. The person whose card is drawn summarizes the work done by team three in the yellow folder cohort. I typically assign four rotating team roles: discussion leader, reporter, recorder, and the folder monitor, who picks up the team folder, distributes any worksheets and the homework (folded over and stapled for FERPA compliance) and collects new homework and any activity sheets completed during class. For easy grading, the grade rosters are organized in team order, aces through kings, allowing the work to be

quickly marked, recorded, and returned to the team folder with no need for alphabetizing and then distributing.

The playing cards also allow me to use a highly effective cooperative learning approach often called “Numbered Heads Together” (renamed by Millis and Cottell, 1998, “Structured Problem Solving”) where students complete a course-related task, such as responding to case study questions, without having a preidentified spokesperson. When everyone knows in advance who the group spokesperson/reporter will be, no one but that unlucky individual needs to learn the material. But, when anyone could be the spokesperson,

students request peer coaching and actively try to understand problems. With “luck of the draw,” the selection is impersonal and the students—often ones who never volunteer—usually feel comfortable responding because they are giving a group response, not their personal answer.

I had anecdotal evidence that a dynamic classroom “community” focused on student learning resulted from the group interactions. Before discovering cooperative learning, I had typically lectured on young adult novels in my Children’s Literature classes. The first time I monitored students in small groups discussing *I Am the Cheese*, a complex novel by Robert Cormier, I realized for the first time that students didn’t even understand the possible plot lines. I was hearing them exclaim, “Wow! Is that really what happened? How do you know? Show me!” With a sinking heart I suddenly realized that my brilliant lectures on symbolism, point of view and character nuances had been over the heads of students who couldn’t navigate the basic plot pathways. Affectively, I knew the class was having a positive impact on students when I read the comment a young Vietnamese day care worker wrote on her final student evaluation. Ahn had struggled in my junior-level English class, but her teammates had been caring and supportive, and best of all—had tutored her. She wrote: “In this class I have found true friends.”

A SECOND BREAKTHROUGH—DEEP LEARNING AS SEQUENCE

Just when I complacently thought my teaching could never be better, another “aha” moment occurred as a result of reading in the *National Teaching and Learning Forum* a four-page summary of the research on deep learning. This brief but profound article taught me two key things: (1) it gave me a reason why cooperative learning approaches could lead to deep learning, and (2) it encouraged me to think of cooperative learning as part of



a sequenced series of activities that built on out-of-class assignments by processing them in class. Here, in another nutshell, is the research on deep learning as summarized by Rhem (1995):

Motivational context. We learn best what we feel a need to know. Intrinsic motivation remains inextricably bound to some level of choice and control.

Courses that remove these take away the sense of ownership and kill one of the strongest elements in lasting learning.

Learner activity. Deep learning and “doing” travel together. Doing in itself isn’t enough. Faculty must connect activity to the abstract conceptions that

make sense of it, but passive mental postures lead to superficial learning.

Interaction with others. The teacher is not the only source of instruction or inspiration. Peers working as groups enjoin dimensions of learning that lectures and readings by themselves cannot touch.

A well-structured knowledge base: This doesn’t just mean presenting new material in an organized way. It also means engaging and reshaping the concepts students bring with them when they register. Deep approaches and learning for understanding are integrative processes. The more fully new concepts can be connected with students’ prior experience and existing knowledge, the more it is they will be impatient with inert facts and eager to achieve their own synthesis (4).

I realized then that cooperative learning was an effective tool, not a be-all and end-all stand-alone pedagogy. When I looked at the deep learning model, I realized that how I sequenced assignments and activities was of crucial importance. Although I tried to connect homework with what went on in class, the students only saw me collect it at the beginning of class and stuff it into my briefcase for later grading. I could now imagine their responses: “I just completed

an artificial assignment so a bored expert can spend hours grading it and returning it days later when it no longer interests me.”

Now, I assign homework on a pass/fail basis and rapidly mark it, assigning pass/fail points only after I have used the homework directly in class. I now process all homework in class to build on what students’ learned at home. Returning to the deep learning model, my goal is to assign motivating homework that gets students into the knowledge base. Then, in class I use cooperative learning approaches to process that homework through active learning and interactive methods.

For example, I became very “intentional” (a word AAC&U frequently applies toward learners and institutions, but teachers must also be intentional) in my use of double-entry journals (DEJs). A DEJ (see figure 1) requires students to read an article or book chapter or listen to a guest lecturer and then using a T-type table to outline the material in the left-hand column. In the right-hand column they respond to each point the author has made. This approach fit the deep learning model because it got students into the

knowledge base by outlining, but the personal responses to the authors’ key points motivated students. I encouraged them to make their comments academic by relating this new material to other course material or other readings, but I also allowed the responses to be personal and anecdotal. The abbreviated example in figure 1 suggests the format, giving some points from the Rhem (1995) article.

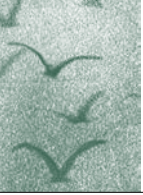
A MINIATURE BREAKTHROUGH—STRENGTHENING SYNAPSES

As I was thinking through my use of DEJs, I had another small breakthrough, one that reinforced for me the need for careful sequencing that allows for “repetition without rote.” “Covering material” does not mean saying something once in class. If we want students to actually learn material, then we need to heed this succinct sentence from Robert Leamson’s (2000) book: “Learning is defined as stabilizing, through repeated use, certain appropriate and desirable synapses in the brain” (5).

When we lecture, our synapses are firing away. There is, however, something wrong with this picture: if we truly want

FIGURE 1. A format that facilitates student response to authors’ key points.

Author’s Critical Points	Your Response
“Learning Styles” have been overemphasized in the research literature.	I would agree! I have never been comfortable with so many different typologies. I have taken courses in the Myers-Briggs instrument, 4-MAT, etc., and I have never understood the distinctions and values. Other than the truism that we should vary our teaching methods, the learning styles information has been of little practical value for me as a faculty developer and as a teacher.
Researchers examined a key question, “What does it take to be good at learning?”	A good question!
Metacognition—thinking about one’s thinking—appears to lie at the heart of learning, and a predisposition toward it appears to be related to the learning environment rather than to learning styles.	No comment . . . I’m eager to read further.
There are four general social orientations: academic, vocational, personal, and social.	Wow! As the author says, faculty resist such vocabulary. I resist more lists! How can “social” be part of the definition and part of the “stem”?



to promote learning, then our students' synapses need to be the ones firing.

So, I completely rethought how I would sequence my use of DEJs. I now use them for key articles focused on content that students *must* master to effectively apply the course material and to gain the requisite knowledge to succeed in future courses or in the profession, concepts that Wiggins and McTighe (1998) refer to as “enduring” understanding.

With Leamson's (2000) words in mind, I set up a sequence, following the deep learning model, that allows students to approach key material five different times in five different contexts: (1) they read the article; (2) they return to the article to complete the DEJ (I typically limit either the number of pages or the number of critical points); and (3) in-class paired students read and discuss each others' DEJs, the active learning and student interaction part

If students had read a work of literature (or tackled densely packed scientific or historical writing) without any previewing, you would lecture with little impact because the students simply could not remember the ambiguous material

of the deep learning model. Unprepared students work on their DEJs in the back of the room, receiving no credit for them. I encourage students to consult the original article as they have authentic conversations; (4) I mark the DEJs and even though the grades are pass/fail, all-or-nothing points, my quick comments satisfy students' need for feedback. More importantly, they cause them to review their DEJs—if only masochistically to see what I have said—for the fourth repetition. (5) Ostensibly to coach students on how to write better DEJs in the future, I project a composite DEJ or use the best student example. This final look at the

material gives students their fifth exposure: I don't need to lecture on these key course concepts.

ANOTHER BREAKTHROUGH—HOW PEOPLE LEARN

Unexpectedly, another major breakthrough occurred when I discovered Bransford, Brown, and Cocking's (2000) *How People Learn*. Their research-based book is focused on three key learning principles:

- **Prior knowledge.** Students construct new knowledge based on what they already know (or don't know)
- **Deep foundational knowledge.** Students need a deep knowledge base and conceptual frameworks
- **Metacognition.** Students must identify learning goals and monitor their progress toward them

I immediately saw a key connection between Bransford, Brown, and Cocking's

work and the research on deep learning: they both focus on deep foundational knowledge based on concepts, not disconnected “factoids.” I also saw the relevance of Angelo and Cross's (1993) *Classroom Assessment Techniques* because many so-called CATs focus on students' prior knowledge—background knowledge probes, focused listing, directed paraphrasing, application cards, and misconception grids, to name a few. CATs can also help both teachers and students determine if students are truly learning the content: concept maps, analytic memos, pro and con grids, and memory matrixes,

for example. CATs can also help students understand their own thinking and self-assess their learning progress through self-assessment of ways of learning, productive study-time logs, and course-related self-confidence surveys, etc.

A FINAL (FOR NOW!) BREAKTHROUGH

A final breakthrough occurred when I was participating in a workshop given by Tony Aretz and Steve Jones (2002) at the U.S. Air Force Academy (USAFA). They read us a “story” that made no sense until they showed us a picture used with the story in an experiment by Bransford and Johnson (1973). Their study had some subjects respond to the “story” without seeing the picture that explained it; others saw the picture before experiencing the ambiguous “story.”

Those who did not see the picture recalled fewer than four of the ideas in the story. The recall of ideas skyrocketed when subjects saw the preview materials (the picture). They recalled eight of the fourteen ideas in the passage. However, those who were offered the preview material (the picture) after experiencing the ambiguous “story,” also recalled fewer than four of the ideas—they took away as much (or as little) as if you had never showed the picture at all. In other words, if students had read a work of literature (or tackled densely packed scientific or historical writing) without any previewing, you would lecture with little impact because the students simply could not remember the ambiguous material.

My “aha moment” was profound: I had just told cadets in my sophomore-level literature-composition course to begin reading *Antigone*. However, I had given them no “picture”—no background on *Oedipus Rex*, no discussion of the role of the Greek chorus, no diagrams of Greek stages or pictures of amphitheaters, no suggestions to look for money and vision



imagery, no challenge to determine Creon's attitude toward women, and no study questions or introductory minilecture.

After seeing this research in the USAFA workshop, I rushed out and immediately emailed my class: "Do NOT read *Antigone*. I will be previewing it at our next class meeting." I have, ever since, stopped whatever work of literature we are discussing to preview the upcoming work.

CONCLUSION

Zinsser's (2009) summary of what constitutes a good writer focuses, like my summary of what constitutes a good teacher, on intangibles. He muses, "Among other changes, I had become more interested in the intangibles—beyond craft—that produce the best writing: matters of character, intention, values, confidence, and enjoyment" (67). All those qualities also apply to good teachers.

Generalizing from my own experience—and years (since 1982) in faculty development—I discovered many intangible but important conclusions. Effective teachers are able to integrate and synthesize. They have internalized all they have learned about pedagogy from readings, from experience, and from mentors and role models. Their teaching is rarely based on only one narrow approach. Further, they have intentionally wedded their own discipline-based content with their pedagogical approaches. They are comfortable with their teaching, and their teaching tools are integrated but eclectic enough to give students alternative teaching approaches. They use examples, metaphors, visual aids, stories, and so forth as teaching tools, and they help students learn materials by strengthening synapses through various neural pathways: hearing, reading, writing, and discussing in pairs or groups.

Effective teachers also teach intentionally, reflecting on their teaching and making changes. Many of them deliberately sequence assignments and activities

to build for deeper learning even if they are unfamiliar with the specific research literature. They plan carefully to design structured assignments. Students understand what is expected of them. And, often because they are motivated by an inspired, inspiring teacher, they strive to meet or exceed those expectations.

They are often motivated by a caring teacher. Teaching is a science more than an "art." A few "natural" teachers seem to develop expertise effortlessly. Most of us labor in the teaching vineyards because



we care about our teaching, about our students, and about our students' learning and professional growth. Sometimes we labor far longer than we should. Learning to teach effectively is typically an evolving process. Caring teachers grow over time, aided by self-reflection, reading, workshops, peer mentors, and faculty developers. Even in these "tough economic times," teaching centers, with some lamentable exceptions, continue to

flourish. They help caring teachers grow and develop; they play instrumental roles in helping institutions commit to student learning, and because effective teachers help produce better educated students, ultimately, they serve the needs of a democratic society. ■

REFERENCES

- Association of American Colleges and Universities. 2000. *Greater expectations: The commitment to quality as a nation goes to college*. Washington, DC: Association of American Colleges and Universities.
- Angelo, T. A., and K. P. Cross. 1993. *Classroom assessment techniques: A handbook for college teachers*. 2nd ed. San Francisco: Jossey-Bass.
- Aretz, A., and S. Jones. 2000. How students learn. Workshop, United States Air Force Academy.
- Bransford, J. D., and M. K. Johnson. 1973. Considerations of some problems of comprehension. In *Visual information processing*, ed. W. G. Chase, 383–438. Orlando: Academic Press.
- Bransford, J. D., A. L. Brown, and R. R. Cocking, eds. 2000. *How people learn: Brain, mind, experience, and school*. Washington, DC: National Academies Press.
- Cooper, J. L., P. Robinson, and D. Ball, eds. 2003. *Small group instruction in higher education: Lessons from the past, visions of the future*, 63–74. Stillwater, OK: New Forums Press.
- Johnson, D. W., R. T. Johnson, and K. A. Smith. 1991. Cooperative learning: Increasing college faculty instructional productivity, ACSE-ERIC *Higher Education Report* No. 4. Washington, DC: The George Washington University.
- Kagan, S. 1989. *Cooperative learning resources for teachers*. San Capistrano, CA: Resources for Teachers, Inc.
- Leamson, R. 2000. *Thinking about teaching and learning: Developing habits of learning with first year college and university students*. Sterling, VA: Stylus Press.
- Millis, B. J. 2002. *Enhancing learning—and more!—through cooperative learning*. IDEA Center. (Accessed March 16, 2009) www.theideacenter.org/sites/default/files/IDEA_Paper_38.pdf.
- Millis, B. J., and P. G. Cottell. 1998. *Cooperative learning for higher education faculty*. Phoenix: Oryx Press.
- Rhem, J. 1995. Deep/surface approaches to learning: An introduction. *The National Teaching and Learning Forum* 5(1): 1–4. (Accessed March 18, 2009) www.ntlf.com/html/pi/9512/article2.htm.
- Slavin, R. E. 1986. *Using student team learning: The Johns Hopkins team learning project*. Baltimore: The Johns Hopkins University Press.
- Wiggins, G. and J. McTighe. 1998. *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Zinsser, W. 2009. Visions and revisions: Writing On Writing Well and keeping it up-to-date for 35 years. *The American Scholar* 78(2): 58–68.