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The Higher Education Research Institute (HERI) reports that 97.7 percent of faculty members rate their role as a teacher as personally very important or essential to them, and that faculty spend significantly more time teaching and preparing for their teaching responsibilities than they do on research or committee work. As many education leaders focus on broad goals for learning, students’ success in reaching these goals depends significantly on effective teaching. How do faculty members measure their effectiveness in the classroom? And what makes certain professors stand out as exceptionally effective teachers?

Looking back at my own professors, two are particularly memorable. The first, a young professor who taught Caribbean History, comes to mind for the distance—more figurative than literal—that he put between himself and his students. One day, midway through the semester, I found myself sitting alone in front of him. I was the only one of fifteen students registered for the class to show up that morning. Instead of taking the opportunity to draw me into the subject with a conversation, he proceeded to lecture from memory for an hour while I struggled to keep from yawning. The professor who sat at the opposite end of that spectrum for me was Caribbean poet Andrew Salkey, who taught creative writing at my college. As he reviewed my work, Andrew would capture his reactions on notes that he pasted at the bottom of each manuscript page. His comments on my short story writing were constructive and honest; they ranged from “I’m disappointed… I thought I’d learn more about your protagonist here” to “Good job of pacing… the suspense is gripping.” Andrew’s thoughtful feedback guided my learning. Thirty years later, I still have the notes that challenged and inspired me to become a better writer.

These, of course, are my reflective evaluations many years later. How do today’s students share feedback on their learning with peers while the experience is fresh? Several college students and recent graduates I polled on this question said that they relied on RateMyProfessor.com to learn about professors and to choose classes. RateMyProfessor (RMP), an independent Web site, allows students to anonymously rate and write comments about their college professors. Founded in 1999, the site now contains more than six million ratings for more than half a million professors. On the site, students praise the “top ten professors” with comments such as: “You really learn a lot and his stories are awesome,” “He is a cool dude!” and “She made boring topics very fun and interesting.”

While many students use this site, faculty reaction to RMP, not surprisingly, is mixed. Michael Arnzen, who writes Pedablogue, a blog about higher education topics, likens the ratings site to the television show American Idol: “Teaching is not a popularity contest, but if you are interested in student feedback on your own teaching, [RMP] is but one of many ways to look for it… I think it is important to separate evaluation from the politics of judgment whenever possible and instead turn evaluation into a method of inquiry.”

Others find some value in RMP. In the August 2009 edition of Assessment and Evaluation in Higher Education, Otto, Sanford, and Ross conclude their article “Does RateMyProfessor Really Rate My Professor?” with the following point: “To the extent that online ratings can be demonstrated as valid measures of instructors’ abilities to inspire learning, online ratings have potential value.” In addition to online student ratings, nearly every college uses course evaluation forms filled out by students, but few professors believe these are adequate measures of teaching effectiveness.

This issue of Peer Review explores the topic of good teaching, not in terms of popularity or students’ own assessments, but in terms of research and practice? In a range of articles, from a report on establishing a new teaching center to insightful advice on effective teaching methods, the journal addresses the challenges faculty face in the classroom today. The stakes are high. As Ross Miller states in his Analysis article, “It is especially important for both teachers and students to believe that all students can learn at high levels, because—from setting expectations and goals, to choosing and responding to assignments, to shaping assessments—believing otherwise will trigger decisions and actions that result in lower achievement.” However beautifully designed our curricula, the proof is really in our classrooms and on our campuses, and in whether what today’s students learn in these places prepares them to make good decisions for an ever-evolving and complex world.

— SHELLEY JOHNSON CAREY

FROM THE EDITOR
Connecting Beliefs with Research on Effective Undergraduate Education

Ross Miller, senior director of assessment, Berkeley College, and former senior director of assessment for learning, Association of American Colleges and Universities

In support of its mission, AAC&U’s projects and publications, institutes, and network meeting all focus on improving undergraduate student learning. Both the recent Greater Expectations initiative and the current Liberal Education and America’s Promise (LEAP) campaign advance the belief that higher education should strive for higher levels of learning for all students. But reports of low graduation rates and of graduates with inadequate knowledge and skills may cause some people, both on and off campus, to question whether holding idealistic beliefs such as those associated with Greater Expectations and LEAP is reasonable. Some skeptics ask whether higher education is hopelessly out of touch with a world in which some students are “college material” and others simply are not.

Faced with difficult choices, we often rely upon deeply held beliefs, attitudes, or philosophies to help us make decisions. When our decisions affect other people, as decisions in education often do, it is important that the beliefs behind those decisions are conscious and have been examined in order to avoid both unwise and arbitrary choices. From setting goals and expectations for learning to addressing the hard realities of the classroom, our beliefs about teaching, learning, and the purposes of education have a profound influence.

AAC&U’s advocacy for higher levels of learning for all students is not misplaced. Education research demonstrates that we can improve student learning—sometimes dramatically—and that maintaining idealistic and inclusive beliefs about and goals for higher education is perfectly reasonable.

Beliefs About Who Should Be in College

Far-reaching global, economic, and technological developments have converged to make postsecondary learning an imperative for almost everyone.

—AAC&U

Through efforts like Greater Expectations and LEAP, AAC&U has argued consistently that all students should have access to excellence in higher education, regardless of background or intended field of study. But questions arise, both on and off campuses, about whether all students can learn at the college level and whether everyone should attend college. Based upon an extensive review of education research, Gardiner (1994, 98) concluded that all students can be educated to high levels.

Research...coupled with modern educational methods and quality improvement principles, can enable us for the first time in human history to educate all of the people to a high level. We will, however, have to use, rather than ignore, research.

Studies Gardiner reviewed also showed that “Using mastery learning...the researchers consistently achieved a full one-sigma increase in assessed learning over conventional instruction.” (98) A full standard deviation increase (i.e., one sigma) is very significant, equivalent to moving from the 50th to the 84th percentile. (With mastery learning, students and teachers focus on current topics until students reach a high level of achievement, moving to subsequent lessons only after “mastery” is achieved. Mastery learning is supported by careful curricular sequencing and feedback from frequent assessments that helps students reach the desired level of learning.)

Additionally, Gardiner (97) reported that mastery learning techniques were especially helpful to students with the lowest initial achievement: all students improved, the lowest achievers improved the most, and the learning gaps among students decreased. George Kuh (2008, 18-19) showed a similar differential boost for initially low-achieving students who experienced engaging pedagogies such as learning communities, internships, and senior capstone seminars.

Two of the practices used in mastery learning include pretesting and monitoring students’ progress during a cycle of learning—
powerful instructional practices deserving of more consistent use in higher education. Other effective practices suggested in Walberg and Paik (2000) include graded homework and cooperative learning. Research on mastery learning and selected effective practices confirms that holding high expectations for students actually helps them achieve.

But what about the should question? According to Carnevale (2000), from 1998 to 2008, 14.1 million new jobs will require a bachelor’s degree or some form of post-secondary education—more than double those requiring high school level skills or below. Given those data, it makes sense to encourage all students to continue their education past high school. Consistent high expectations for all students to take a challenging high school curriculum and prepare for college (or other postsecondary education) benefit everyone. Our current practices of holding low expectations for many students result in far too many drop-outs or graduates unprepared for college, challenging technical careers, and lives as citizens in a diverse democracy.

BELIEFS ABOUT GOALS
The first object of any act of learning... is that it should serve us in the future.

—Jerome Bruner

It is no secret that much material covered in college courses is neither remembered nor used. Bransford, Brown, and Cocking (2000, 16) write of college physics students whose performance in a game requiring an applied understanding of momentum was no better than that of elementary school students. Such an outcome suggests that these students’ learning in physics was not serving them even in a simple problem-solving context, let alone as a foundation for future sophisticated learning or performance.

Bruner implies that, in setting goals, we should consider the question, “to what end?” As part of its LEAP initiative, AAC&U advocates for a broad set of “essential learning outcomes” (AAC&U 2007) in areas of knowledge, intellectual and practical skills, personal and social responsibilities, and integrative learning. These outcomes prepare students to be effective workers and citizens in a diverse democracy—an end to college education worthy of our efforts.

Revealing objectives to students is more than just a courtesy—it improves achievement. Gardiner (1994, 24) reports that Knowing clearly what desired outcomes should be and having specific and timely knowledge of actual results achieved contribute powerfully to improving performance…. Students need to know what they should know and be able to do and, on a regular basis, how well they have succeeded in their efforts.

Giving students detailed assignment descriptions and/or rubrics with criteria for success can clearly inform them of the goals for work they are to complete.

Bransford, Brown, and Cocking (61) add another dimension:

Learners of all ages are more motivated when they can see the usefulness of what they are learning and when they can use that information to do something that has an impact on others—especially their local community.

Whether you think you can or think you can’t—you are right.

—Henry Ford

Closely related to goals for learning are the expectations for learning that teachers hold for students and that teachers hold for their own teaching ability. When teachers communicate expectations to students—whether high or low—students tend to meet those expectations. (Cotton 1989 citing Good 1987). Schilling and Schilling (1999) document an increase in the time seniors spend on academic work when their institutions established high expectations during their first year in college.

Teachers’ opinions of their own teaching skills also are critical. “Teachers who produce the greatest learning gains accept responsibility for teaching their students. They believe that students are capable of learning and that they (the teachers) can teach them.” (Alkin 1992, 1375) Teachers who doubt their own efficacy often exert little effort in reshaping instruction to help students. Teachers with a high sense of efficacy adapt instruction to student characteristics and show a high level of tolerance for students’ varied learning approaches. A commitment to high expectations for students, then, requires ongoing faculty development to enhance teachers’ own ability and confidence to assist students with varying levels of preparation.

Students and teachers attribute successes and failures either to changeable or unchangeable factors such as effort and ability (respectively). Lumsden (1997) notes that

In the U.S....innate ability is viewed as the main determinant of academic success. The role played by effort, amount and quality of instruction, and parental involvement is discounted... Poor performance in school is often attributed to low ability, and ability is viewed as being immune to alteration, much like eye or skin color. Therefore, poorly performing students often come to believe that no matter how much effort they put forth, it will not be reflected in improved performance.

It is a peculiarity of American culture that we assign so much of a learner’s success to his or her innate ability. Education research in Japanese and Chinese schools shows that teachers and students alike attribute their successes and failures more to training received and effort expended than to ability (Stevenson and Stigler 1992,
94–112). When teachers believe that hard work is important to success and consistently convey this belief to students, they communicate both high expectations for student learning and pull an effective lever to improve results.

BELIEFS ABOUT TEACHING AND ASSIGNMENTS

You learn what you do and damn little else.

—Charles Leonhard

Improving student learning relies on alignment—planning assignments, assessments, and revisions to ensure that goals are achieved. Since “you learn what you do,” it makes sense to require students to actually practice what we expect them to achieve. For example, if critical thinking is a goal, students need to do more than read an article in which the writer displays critical thinking. Students must somehow be led to think critically for themselves.

If critical thinking is a goal, students need to do more than read an article in which the writer displays critical thinking. Students must somehow be led to think critically for themselves.

Teachers, both prospective and experienced, are often advised to plan their teaching so that students spend a significant amount of time at the highest levels of the cognitive domain, and to use positive reinforcement whenever possible. Most colleges and universities as well as individual departments and programs advocate for students to learn at the highest levels of the cognitive domain—to analyze, to create, to evaluate. In spite of nearly universal support for such outcomes, studies show that the time spent on these challenging levels of learning is low. Audiotapes from 155 classes at four institutions were collected and

Questions asked in class were analyzed for the level of thinking skill required for students to answer them. Memory level...questions accounted for 89.3 percent...Evaluation level thinking...occurred only 0.3 percent to 2.5 percent of the time...As the cognitive level of instructors’ questions rose, the level of students’ responses also rose (Gardiner 1994, 43).

While the small percentage of high-cognitive-level questions is disappointing, the fact that the level of student responses corresponded to the level of questions shows that higher level thinking is not beyond students’ capabilities. Professors, however, could certainly ask more questions (or give more assignments) that elicit high-level thinking—especially if they expect such thinking to be an outcome of their courses.

The term “reinforcement” may dredge up memories of Skinner boxes and dancing pigeons but interestingly, the simple act of giving feedback to students can have a huge impact on learning. Research shows an “effect size” of 1.17 for reinforcement—equivalent to moving an “average” student (50th percentile) up to the 87th percentile (Walberg 1984). Building a learning culture in which students regularly receive feedback and
reinforcement has great potential for improving student learning.

**BELIEFS ABOUT ASSESSMENT AND IMPROVEMENT OF STUDENT LEARNING**

A common mantra about assessment is that its primary purpose is to improve student learning. While assessment can serve a number of different purposes, many efforts to develop campus assessment practices over the last two decades have been defined as assessment for improvement—with advocates promoting a variety of possible approaches and skeptics pointing out real and potential problems. The word “assessment” often means different things to different individuals and within different disciplines, creating fundamental problems in shared understanding across campuses and institutions. Given that developing local assessment methods is quite new for higher education (with serious attention beginning only a decade or two ago), it is not surprising that campuses and individuals still struggle with assessment.

There are, nonetheless, several important research studies that support the development and use of assessment to teach and improve learning. One ideal tactic is to have formative assessments embedded within a teaching-learning-assessment-improvement cycle in such a way that they become a powerful part of teaching—not a separate process added on as an afterthought.

Formative assessment is a process in which critical feedback is given to the learner while she is still in the process of completing learning activities—whether writing a paper, practicing a sonata, or synthesizing a new compound. Bransford, Brown, and Cocking (24) found that formative assessments help both teachers and students monitor progress.

Bransford, Brown, and Cocking conclude (154)

Students may receive grades on tests and essays, but these are summative assessments that occur at the end of projects; also needed are formative assessments that provide students opportunities to revise and hence improve the quality of their thinking and learning.

Formative assessment has been recognized as especially beneficial for students who are experiencing difficulties in learning (Black and William 2-3).

Teacher-education programs commonly suggest that educators teach their students to self-assess. Teaching students to self-assess advances a number of positive goals: as students evaluate their own work they move into the highest level of the cognitive domain, they complete their own formative assessment, and they assume some of the teacher’s assessment load. Bransford, Brown, and Cocking cite developing students’ self-assessment capacities as part of effective teaching (140):

Effective teachers also help students build skills of self-assessment. Students learn to assess their own work, as well as the work of their peers, in order to help everyone learn more effectively.

Data from many different assessment efforts, both formative and summative, can also be analyzed to help improve programs or entire institutions and thereby future student learning outcomes. A summative assessment of student learning (such as a senior capstone project) may become a formative self-assessment for a program, clearly contributing to “the primary purpose of assessment” but on a different level.

**COPING WITH THE REALITIES OF THE CLASSROOM**

Idealistic teachers may get discouraged when confronted with the thorny problems of teaching real students unless, as Gardiner says, they “use, rather than ignore, research.” The research is supportive whether one is motivated by his or her beliefs or simply trying to solve educational problems. Research with potential to address several common classroom frustrations has already been cited. For example, frustrations with low student motivation and too little time spent on assignments may be helped through the use of teaching practices that engage students...
and through institution-wide efforts to raise expectations for amount of time spent studying. Uneven levels of preparation and/or achievement among students in a class may be addressed through mastery learning techniques and targeted formative assessment. Negative attitudes about requirements (“Why do I have to take this course?”) may improve if we carefully explain program goals, purposes, and rationale. Solutions for many other problems exist in the literature.

While some issues of campus culture may respond to wise application of education research, situations that contradict well-established principles of teaching and learning may require structural, not instructional, changes. For example, many professors have neither studied teaching nor become familiar with educational research. Thus, fulfilling institutional and professional commitment to student learning requires substantive faculty development and an approach to promotion and tenure that rewards time spent on improving teaching to advance student learning outcomes. Similar issues include classes with too many students and faculty with too many courses to teach.

**FINAL THOUGHTS**

Within the college classroom, teachers and students make thousands of decisions that affect learning. It is especially important for both teachers and students to believe that all students can learn at high levels, because—from setting expectations and goals, to choosing and responding to assignments, to shaping assessments—believing otherwise will trigger decisions and actions that result in lower achievement. Having convincing evidence from multiple sources that our chosen actions have the possibility to succeed can help sustain our efforts and result in achieving the important goals in which we believe.

**REFERENCES**


**A NOTE ON EPIGRAPHS:**

Sources for the epigraphs found in this piece are as follows: Association of American Colleges and Universities, College Learning for the New Global Century; Jerome Bruner, The Process of Education; Henry Ford, quote commonly attributed to Henry Ford, www.quotationspage.com; Charles Leonhard, personal communication with the author, attributed by Leonhard to his study of John Dewey’s writings.
Understanding Great Teaching

Ken Bain, vice provost for instruction, professor of history, and director, Research Academy for University Learning, Montclair State University

James Zimmerman, associate professor of chemistry and associate director, Research Academy for University Learning, Montclair State University

At Texas A&M University recently, the chancellor created a firestorm of controversy over his plan to pay faculty members hefty bonuses for favorable comments and ratings from students. Some people feared the plan would become a corrupting influence, leading professors to buy high marks from their students with inflated grades or free beer. For student supporters of the idea, however, it was an opportunity to express legitimate assessments of their teachers. “I understand their concerns,” one student leader said of the plan’s critics, “but a student can distinguish between a good teacher and a popular teacher.”

Behind that controversy lies a much older struggle over the very meaning of good teaching. If there is a difference between good instructors and popular ones, what is it? Every year hundreds of promotion and tenure committees struggle with that question, and for good reasons. Without some definitions, all attempts to improve teaching wander aimlessly in a sea of conflicting ambitions. In this essay, we offer a way across those troubled waters. With a definition of good teaching clearly in mind, we can then offer some insights into how the best teachers achieve them.

DIFFERENT STUDENT APPROACHES TO LEARNING

Our journey begins with a single experiment in 1976 that, at first glance, seems far distant from any questions about teaching quality and how to achieve it. In that experiment, researchers at a Swedish university gave a group of students a text and said, here, read this; when you finish, we’re going to ask you some questions.

After the reading was done and the researchers began asking questions, they quickly realized that different students had taken fundamentally different approaches to the exercise. On one end of the scale of responses, students had simply attempted to remember as many details as possible, trying as best they could to replicate what they had read. On the opposite end of that same scale, other students had thought about arguments they encountered in the text, and had distinguished between evidence and conclusions in those arguments. They had identified key concepts, mulled over assumptions, and even considered implications and applications. The researcher called the first group “surface learners” and the second, “deep learners.”

In subsequent investigations, researchers identified a third kind of approach, often called “strategic learners.” The strategic student is primarily concerned with making good grades, and while that may seem like an acceptable alternative, it has some severe limitations. The strategic student isn’t focused on understanding or application, only with making high marks. They generally are not risk takers. They will often choose the easiest way out rather than the one that will help them grow intellectually.

We should emphasize that these three categories—deep, surface, and strategic learning—refer initially to the feelings that students have toward their studies and the strategies they employ in that learning. Generally, surface learners fear failure and simply try to survive academically. They try to replicate what they encounter. Because they understand little, they complain on the math exam, “You didn’t show us a problem exactly like that one before.”

Strategic learners want high grades, and will typically spend time trying to find out what the teacher will ask them. For that math exam, they may memorize formulas and master algorithmic procedures, but, as we will discover later in more detail, they will often fail to understand conceptually, and their learning will have little sustained or substantial influence on the way they subsequently think, act, or feel. Only deep learners are primarily concerned with understanding, with how to apply their ideas to consequential problems, with implications, and with ideas and con-
cepts. Only they are likely to theorize and make connections with other ideas and problems. Only they are likely to become adaptive experts who both recognize and even relish the opportunity and necessity for breaking with traditional approaches and inventing new ones.

Much of the research around these concepts has focused on why a student might take surface or strategic approaches, and it is that research that ultimately ties back to our initial question about the nature of great teaching. If you suspect that the answer is simply that smart students take deep approaches while less capable people take surface ones, you won’t find much support for your suspicions in the research findings. Instead, you will discover considerable evidence that the major reasons why anyone takes a deep, surface, or strategic approach can be summarized in a single word: “schooling.” In other words, it is what teachers do with students that makes the biggest difference. Some teachers produce lots of students with deep intentions while others rarely produce any. Thus, we could think of great teachers as those people with considerable success in fostering deep approaches and results among their students.

INVESTIGATING GREAT TEACHING

We used that simple idea to investigate great teachers. We wanted to find and examine people who nurture deep approaches to learning. Bain published the initial results of that study in 2004 but this investigation into great teaching has also been an ongoing focus of the Research Academy for University Learning at Montclair State University. What we have found will not surprise anyone familiar with the growing literature on good teaching.

Before we explore some of those primary findings, however, we must note one other factor that can prevent even students with good intentions from achieving a deep, conceptual understanding. It has to do with the way the mind creates meaning, and it is something highly successful teachers understand profoundly. When human beings learn, we construct our own sense of reality. We begin that process in the crib where we encounter a barrage of sensory input coming at us through our five senses. Since we are not born with dictionaries in our diaries, we have to make sense of all that data streaming into our brains. We do so by connecting one sensory input to another, testing and confirming these causal linkages, and building sophisticated mental models as a result.

We also begin to use those constructed paradigms to understand new sensory input, and we continue doing that for the rest of our lives. Before you enter a room for the first time, you already have a model of something called floors, ceilings, walls, and furniture, and you use all of those constructed models in your mind to understand the sensory input you receive from “seeing” things. You understand the room, not just in terms of the light waves hitting your retina, but also from the previously constructed mental models you brought with you.

That ability, that habit, of understanding something new in terms of some model we already have in our minds proves to be enormously useful as we navigate the world. But it also creates—as good teachers realize—one of our greatest challenges as educators and learners. Often we want our students to build new models of reality, or at minimum to question some of their existing ones. In the humanities, we often say, educated people are able to realize the problems they face in believing whatever they may believe. In the sciences, we say that learners, when confronted by overwhelming data, should abandon old models and adopt new ones consistent with the data. Either way, we are expecting our students to engage in what might be regarded as an unnatural act. While their natural tendency is to understand the new in terms of the old, we are asking them to build completely new models of reality, or question old ones. Most students don’t do that very well, or very easily.

The problem to which we refer is well illustrated by a story told in the second chapter of What the Best College Teachers Do. Some years ago, two physicists at Arizona State University asked this question: Does my introductory physics class change the way students think about motion? You can substitute for the phrase, “think about motion,” anything that fits within your own academic discipline. Does your course change the way students think about…you fill in the blank. To find out in physics, these two scientists devised an instrument—the Force Concept Inventory (FCI)—to measure students’ conception of motion and administered that instrument to several hundred people coming into an introductory course. On the front end, they discovered that most students came into the course with what might be described as an Aristotelian view of motion. It wasn’t a nonsensical belief, but it wasn’t the way modern physics thought about motion either—not since Newton, let alone Feynman.

But that’s before the students took the course. Some months after the term ended, they brought the students back and gave them exactly the same instrument to see how much change had taken place in their basic concepts of motion. Guess what? Virtually none. Even more disturbing, the degree of change didn’t seem to be related to the grades that the students had made. The A and C students brought their Aristotelian views of motion to the class and both groups simply wrapped all of the sensory input they received around their existing models—the textbooks they read, the lectures they heard, the experiments they performed in the lab—and those models did not change. Many A students were simply better at memorizing formulae...
and plugging the right number into the equation, but in terms of conceptual understanding, the FCI data suggested that they were probably no better off than their C colleagues. Yet this problem does not exist only in the sciences. It prevails in all fields because we are all dealing with human beings who are attempting to reconcile new sensory information with their existing mental models. Sam Wineburg captured the point in the title of his prize-winning book, *Historical Thinking and Other Unnatural Acts.*

If this is such a huge problem, however, how do great teachers overcome it? Certainly not by just telling the students the "truth." Those physics students were told the truth repeatedly, yet it had little influence on their conceptual understanding. How then can great teachers stimulate a deep approach to learning that can have a sustained and substantial influence on the way students will subsequently think, act, and feel? How do the subjects of our ongoing study achieve the unnatural?

Here's a summary of what our great teachers told us: Human beings are most likely to learn deeply when they are trying to solve problems or answer questions that they have come to regard as important, intriguing, or beautiful. This is their description of what we call the Natural Critical Learning Environment (you can see more about that kind of environment at www.montclair.edu/academy/ncle.html and the links from that page). Moreover, students are most likely to question and perhaps shift their paradigms if, in the course of pursuing those questions or problems, they find themselves in a situation where their existing paradigms produce incorrect or unsatisfactory explanations. They face what some have called an “expectation failure”—their mental model has predicted an outcome, but that expected result doesn’t match with their current sensory input and how they interpret it. What happens next is critical to the development of the learner and speaks directly to the distinction uncovered by a simple experiment conducted in Sweden more than thirty years ago. When faced with new information that is in conflict with their current mental model, students typically invoke one of two processes.

They can choose to take a surface approach to this event by dismissing this new information as a special case and simply wrapping it around their current paradigm, or those same students can take a deep approach by grappling with how this new information will irrevocably change their mental model, ultimately creating a new and deeper conceptual understanding. If they have an opportunity to grapple with the dissonance they encounter—to try, fail, receive feedback, and try again—before anyone makes a judgment of their efforts, they are more likely to learn deeply.

The course of action chosen by a student confronted with an expectation failure is hardly an individual choice made in a vacuum. Research indicates that a student’s response to this type of event can be greatly influenced by the words, actions, and assessment choices made by the teacher. Not all college classes provide opportunities for students to choose the deep approach, yet that chance forms a key ingredient of a Natural Critical Learning Environment.

**ENCOURAGING A DEEP APPROACH TO LEARNING**

So what can a teacher do —indeed, what do the best teachers do—to encourage students to take a deep approach to their learning? Hanging in the front office of the Research Academy for University Learning at Montclair is an old poster from the 1930s. It’s one of those Depression era placards encouraging schoolchildren to develop good habits. A little boy is tugging at a large yellow question mark, hooking a book labeled “knowledge.” The caption reads: “Ask Questions. Sometimes the only way you can capture Mr. Knowledge is with a question mark.” A bit stilted and old-fashioned, the poster nevertheless captures something we’ve known for a long time. People are most likely to learn deeply when they are trying to answer their own questions or solve their own problems.

**Human beings are most likely to learn deeply when they are trying to solve problems or answer questions that they have come to regard as important, intriguing, or beautiful**

Lots of evidence points to that conclusion. But here’s the catch: in a formal educational environment, learners typically are not in charge of the questions. Teachers usually frame the curriculum and at least implicitly shape the questions. Perhaps rightly so, but that reality produces an enormous chasm between an ideal *natural* critical learning environment and conditions existing in most universities. To bridge that gap, to reach the students educationally, the best teachers—and this may be their most profound ability—find ways to link their own disciplinary concerns and interests with those of the students. This special genius we saw in our best teachers was the ability to frame questions in ways that would both capture the students’ imagination and challenge some of their most cherished
paradigms. The best teachers found questions that were already on the minds of their students and helped them move to new inquiries that those students had never imagined.

As a student of U.S. politics, Melissa Harris-Lacewell, a professor of politics at Princeton, had a question she wanted her students to consider about that historical period we call Reconstruction, which took place immediately following the American Civil War. How did Reconstruction influence the development of political institutions and traditions, and social and economic realities, especially for African Americans? If she had asked that question initially of a group of typical undergraduates, however, only a few of the history buffs might respond with much enthusiasm. Rather than asking that question, she began with another question that she knew was already on the minds of her students. She knew it was on their minds because as a political pollster, she knew in fall 2006 that particular question was on the minds of most Americans, and had been for a year. It was a question that has transformed American politics since August 2005: What in the world happened with Katrina? How did a Category 3 hurricane—certainly not the biggest beast ever to churn the Gulf waters—wipe out an American city? How did that disaster happen?

She organized a class called Disaster, Race, and American Politics, and invited her students to study questions about disaster and Katrina. When the class began, however, she subtly shifted the agenda while keeping her students on board. When did the disaster begin, she asked the class: Did it begin when the storm struck New Orleans in August 2005? Or did it begin in 1866 with the beginning of Reconstruction? Suddenly, she had transformed their initial interest to questions she had in mind, and sparked their focus on issues that were probably far afield from their initial concerns. She had bridged that chasm that often ensnares the best of educational intentions.

When Donald Saari goes into his calculus class on the first day, he often carries two items, a large rectangular paper cutout with a sinusoidal top edge and a roll of toilet paper. With a big grin, a great sense of fun, and a positive attitude that says, I think you can do this, he holds up the paper cutout and says to the students, “This is the area under the curve. How can we calculate it?” With Socratic questioning and in a non-threatening atmosphere, he prods them into constructing a way to solve the problem, almost as if it is a big Sudoku puzzle. “When I finish this process,” he explains, “I want the students to feel like they have invented calculus and that only some accident of birth kept them from beating Newton to the punch.” Unlike so many in his discipline, he does not simply perform calculus in front of students; rather he raises the questions that will help them reason through the process, to see the nature of the questions, and to think about how to answer them. The roll of toilet paper? How can we calculate the volume of this roll of toilet paper? “Toilet paper works well,” Saari once explained, “because it’s so absurd. No one expects it. And also because we can tear off sheets and begin to consider the relationship between the area of those sheets and the volume of the whole roll.” Saari told us recently that he doesn’t use “real life examples” He uses absurd examples that students will find fascinating. But it isn’t the absurdity that makes it work. It’s the ability to engage students in something they will find fascinating partly because it’s so unexpected but also because someone has taken them seriously. It’s the novelty that challenges their already existing mental models regarding the items in question.

In these cases, and in many others we have observed, one important pattern prevails. Through the power of the questions they raise, these outstanding teachers engage students in doing the discipline even before they know the discipline. While most undergraduate textbooks are organized deductively, moving from general principles to specific examples, teachers who promote deep learning approaches help students to learn inductively, moving from fascinating and important questions to general principles of the discipline. Aristotle said it long ago: “For the things we must learn to do before we can do them, we learn by doing them.” John Dewey added, “We don’t learn from experience; we learn by reflecting on experience.”

Can students tell the difference between “good teachers” and “popular teachers,” as the student at Texas A&M suggested? Probably, but only if they take deep approaches to learning and we ask them the right questions. In a particularly elegant experiment, Scottish researchers Hillary Tait and Noel Entwistle found that deep learners said they liked courses that pushed them to explore conceptual meanings and implications, whereas their surface learning classmates hated such experiences. Surface learners praised courses that valued recall while deep learners said they didn’t learn much in those environments.

Student ratings have their limitations, and it is precisely those limitations that call for clearer notions about what we mean by good teaching. If we think of excellent teachers as those people who help and encourage their students to take deep approaches to their learning, we can begin to identify, as we have done in this essay, those practices and perspectives that achieve those noble ends.

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REFERENCE


A challenge for faculty striving to broaden and update their courses is how to introduce new material about which many students may be relatively ignorant and misinformed and hold incorrect and negative stereotypes (e.g., evolution, racism, workers’ unions, immigration, gender differences, socialism, sexual orientation). I faced this challenge recently while teaching a course in which I wanted to strengthen students’ understanding of the religion of Islam. I considered how to minimize student resistance to engaging with Islam or any eruption of emotions in the classroom, as these could be obstacles to attaining student learning objectives. Yet I wondered whether a modest and cautious approach to teaching about Islam would be sufficient for attaining those objectives. Fortunately, the answer is yes: devoting only a few classes to learning about Islam can bring about critical thinking and substantial changes in students’ understanding.

Islam is one of the fastest-growing religions globally, in the United States, and among students on college and university campuses. Yet Islam continues to be portrayed by many American political and religious leaders and in the popular media with false and negative stereotypes, as a religion of violence, extremism, and terrorism. Muslims are often portrayed as violent and un-American and as fair targets for prejudice and discrimination. According to a 2006 Washington Post and ABC News poll, roughly half of Americans view Islam negatively, a third have heard prejudiced comments about Muslims recently, and a quarter admit to being prejudiced against Muslims. Negative attitudes and prejudice toward any religious or ethnic group corrode and destroy civic life in our democracy. Higher education shares America’s responsibility and has an important role in changing such attitudes. Fortunately, the study of Islam can easily be integrated into general education courses that address essential learning outcomes such as civic and intercultural knowledge, as well as into advanced courses in comparative literature, history, political science, art history, religious studies, philosophy, and economics.

Yet misinformation and negative stereotypes, whatever the topic, can make some faculty reluctant to incorporate updated, relevant material into their courses. Doing so could open the classroom to students’ questions (both sincere and disruptive) that faculty might not be prepared to answer, or to students’ opinions and emotions they might not know how to handle. So, to take Islam as an example, some faculty choose not to teach this topic at all, hoping that elsewhere on campus other faculty are taking up this responsibility. And other faculty, while recognizing the importance of Islam in their courses, hope students will learn sufficiently from the textbook—assuming the textbook provides depth and balance—and avoid discussing Islam in the classroom. In contrast, using my teaching about Islam as an example, I’ll describe how I engaged students on a topic about which many were initially ignorant and misinformed and likely held negative views.

My goal was to strengthen the students’ understanding of Islam and Islamic history and culture in World Civilizations, a general education course with about four hundred students. I supplemented the textbook by adding three to four lectures on Islam, the Qur’an, and the history of Islamic civilizations and by focusing two of the weekly recitation classes on discussing selections from the Qur’an. Of course, the student learning goal was not to encourage students to agree with the tenets of Islam or to convert. Instead, the goal was merely for students to become more knowledgeable about Islam, to become familiar with what Muslims believe and do, and to recognize and reject common stereotypes and misunderstandings.
SUGGESTIONS FOR COUNTERING MISINFORMATION AND STEREOTYPES

Here’s what guided my thinking as I considered how to transform my teaching and facilitate students’ learning about Islam:

1. I started with small steps, strengthening my teaching about Islam while gradually expanding my own understanding, rather than committing to teach an entire course on Islamic history and culture. Similarly, I had modest goals for student learning, aiming merely to increase their familiarity with and knowledge about Islam.

2. I sought to legitimize the place of Islam in the course by treating this topic similarly to how I would be teaching other world religions. I introduced each religion in the same way: with a short list of common questions (for example, when and how did the core texts first appear in written form?). If, in contrast, I had introduced Islam in a special way, for example, as “controversial” or as “an issue,” this would have reinforced the negative stereotypes that some students held. I believe standardizing the teaching of religion in this way encouraged many students to be more open toward learning about Islam.

3. Given the widespread misinformation and negative stereotypes about Islam, it seemed to be the ideal time to engage my students with an original text, that is, for us to go together to the ultimate source, the Qur’an, and see what is in fact written there. Much of the Qur’an is quite readable, familiar, and readily understandable for students, especially the later and shorter chapters. A very good translation and a Penguin classic is The Koran, edited by Dawood (2004). This inexpensive edition also shows verse numbers on the page margins, making it easy for students to locate assigned readings, especially during classroom discussions. In contrast—given widespread misinformation and negative stereotypes—if I had merely lectured to students about Islam based on my own reading, it would have been too easy for students to discount what I said as selective and biased and so hold to what they initially believed. Similarly, if I had asked students to read from secondary sources about Islam, they could have minimized the significance of their reading by assuming that other contradicting secondary sources exist that would still support their own beliefs.

4. I organized the sequence of topics to begin with “cool,” neutral topics and delay any “hot” topics until most students had acquired a minimal yet foundational understanding of Islam, a prerequisite for further discussion (see Meacham 1995). I began by addressing common misunderstandings, such as where Muslims live and what they believe and do and what the Qur’an says about relations between Muslims and people of other faiths. Only later did we discuss, for example, what the Qur’an says about equality of women with men and the rights of women in Muslim society.

5. I held an informal workshop with my teaching assistants to explain why teaching about Islam was being emphasized in our course and what the student learning objectives were. Also, I wanted to make certain that they understood why I had chosen particular verses from the Qur’an to assign for reading; and I provided them with suggestions for how they could guide student discussion of these verses.

6. I set aside ample time in lecture to present my rationale for why Islam and Islamic history and culture should have greater emphasis in the course than what the textbook alone would be providing.

7. I resisted the temptation to strengthen the presence of Islam in this course by inviting as a guest speaker someone more knowledgeable and credible. Of course, there are many gaps and errors in my understanding of Islam. Yet I wanted to convey to students that knowing about Islam is so important that we shouldn’t rely on others to tell us what to believe. Instead, seeking a better understanding of Islam is a responsibility of all citizens in a democracy such as ours. And so I tried to be a good model for my students, that is, someone who is not Muslim and yet is struggling to better understand Islam.

If I had merely brought an expert on Islam into the classroom, the implicit message would have been that the students, too, could abdicate their responsibility for learning and simply trust presumed authorities to tell them what to think.

8. I did my best not to tell the students what to think about Islam and, instead, trusted that if they could themselves read directly from the Qur’an and discuss what they had read and share their insights with peers, they would be able to come to a better understanding. Efforts to counter misinformation and negative stereotypes by simply telling...
students what we believe to be correct will not lead to changes in knowledge and attitudes that last beyond the end of a class or course. In contrast, providing students with opportunities to engage with new ideas and discuss these with their peers, to be active in confronting and resolving dissonances in what they believe, and to reflect upon what they are learning and construct their own enhanced understanding can lead to enduring changes in knowledge and attitudes.

9. I included a short writing assignment as a further opportunity for students to review, reflect upon, and integrate what they had been learning about Islam. These assignment topics were quite open-ended; for example, What surprised you, if anything, in these verses from the Qur’an, and why? Or, What has been the main change in your understanding of Islam and its place in history and the present? These short papers counted for very little in the course grading scheme, and so I hoped that students would feel free to explore their own ideas, raise questions, and write what they were truly thinking.

10. I planned how to assess whether this approach to teaching about Islam would have any impact on the students. I constructed a questionnaire for students to assess their own understanding of various course topics. A few questions inquired into students’ understanding of Islam and other world religions. I asked students to complete this questionnaire anonymously at the beginning and end of the course. Also, I made photocopies of the students’ short papers, so that I could read these again later and consider more thoughtfully how the students were responding to my teaching and what they were learning about Islam.

**A CAUTIOUS APPROACH CAN BE EFFECTIVE**

Can such a modest, cautious approach—only a few classes, moderate student learning goals, focusing on cool or neutral topics, trusting the students to construct their own understanding—be effective in changing students’ knowledge and attitudes when the topic is one for which students have likely come to class with misinformation and negative stereotypes? The answer is “yes,” in this example of teaching about Islam.

At the beginning of the course, three quarters of the students agreed on the questionnaire that they could describe, explain, and give examples of Christianity. In contrast, only a quarter agreed that they could describe, explain, and give examples of Islam, and even fewer that they could do so for Islamic history and culture. At the end of the course, three quarters of the students now agreed that they could describe, explain, and give examples of Islam, and slightly more than half that they could do so for Islamic history and culture. Thus a relatively modest amount of teaching about Islam was sufficient to increase by threefold the number of students who felt more knowledgeable about Islam. (As a control question, students were asked to assess their understanding of the practices of science, a topic not taught in this course. There were no changes from the beginning to end of the course, suggesting that students were in fact thoughtful and careful in responding to the questions.)

Further evidence of the effectiveness of this approach to teaching comes from student papers: The most common theme that emerges is the students’ discovery of similarities among Islam, Christianity, and Judaism. For example, one student wrote, “I thought that Muslims were very different from Christians, but reading the Qur’an reminds me of the Bible in many ways.” A theme in about a fifth of the papers is that Islam is a peaceful and tolerant religion. For several students, this insight was a marked change from what they had previously believed: “Before learning about Islam in this course I was under the impression that the Islamic faith had violent roots in its religious beliefs and was intolerant of other religions. But after reading parts of the Qur’an and learning more about the Islamic faith, I see that this could not be further from the truth.”

The theme of another fifth of the papers is that the place of women in Islam is more positive than what these students had been expecting. Several students wrote that the main change in their understanding of Islam was learning that Muslim women have rights equal to or similar to those of men and that these rights, for example, with respect to inheritance and divorce, were greater than for most Christian women and for most centuries, until recently. For example, one student wrote that “I used to think that Islam was a lot more oppressive of women than it really is.” About a tenth of the students focused on what the Qur’an says about how Muslims should live their lives. For example, one student wrote: “The main change in my understanding of Islam would be how much attention Muslims give to doing the right thing. Before taking this course I didn’t know how much the

**The most common theme that emerges is the students’ discovery of similarities among Islam, Christianity, and Judaism**
Qur’an talks about doing things with a kind heart and good will toward others.”

About a tenth of the students (overlapping with the groups above) chose to write not merely about changes in their knowledge but also about changes in their attitudes toward Islam and Muslims. And several students took advantage of this writing opportunity to be reflective and engage in critical thinking, both about themselves and about American media and society. Here are some examples:

“’To try and summarize my understanding about Islam, based on the few days we spent on this subject, seems exceptionally naïve. Obviously, there’s a lot I don’t know and would probably never understand in a lifetime. I questioned a pastor friend who teaches at another college about his understanding of the Qur’an and he said that he didn’t know much about it. This speaks volumes to me about our need as a global society to gain appreciation and understanding of one another’s diversities. Although I may not agree with Muhammad’s revelation from God, I certainly need to respect those who do.”

“I used to think that Islam was a religion for savages and terrorists. I know now that this is not the truth. Islam is more than that, it is a religion of real, honest people, just like Christianity—only different.”

“The several lectures that were given about Islam opened my eyes into the true side of Islam, a side I did not know because the media portrays it in a certain way. The media portrays Islam only from the side of the fundamentalists; only the violence of the religion is shown, isolating it from other religions. What I have learned is that Islam is similar to Judaism and Christianity.”

“The Qur’an is a very useful tool in disproving the stereotypes about Islam that I once had. After reading selections from the Qur’an I feel that the religion is about being faithful to God and living a good, truthful, and honest life.”

“My understanding of Islam and its place in history has changed. I knew that Islam had been part of different nations. Yet I failed to realize that it is more than that. It is the way people live. What is so scary about Islam? I don’t find anything.”

“After spending much time studying Islam and passages from the Qur’an, I have learned that many of the prejudices that are held by people regarding Islam are quite simply false.”

Thus both the questionnaire results and what the students wrote in their short papers provide evidence of the effectiveness of a cautious, modest approach to teaching on topics for which there can be misinformation and negative stereotypes. As important is that the students and I were able to engage, discuss, and learn about Islam without noticeable student resistance. Only three or four students, out of several hundred, provided negative comments about my teaching of Islam in end-of-semester course evaluations.

I am confident that the great majority of today’s students accept that the goal of a liberal education is to prepare them to live in a rapidly changing and shrinking world and that becoming free from ignorance requires that they learn more about historical and cultural contexts other than their own. With an approach to teaching similar to what I have outlined above, students can be encouraged to listen, read, discuss, and reflect. They then find that engaged learning and critical thinking can be worthwhile.*

REFERENCES
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.

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 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.”

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

**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 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 Leammonson’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...

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

<table>
<thead>
<tr>
<th>Author’s Critical Points</th>
<th>Your Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Learning Styles” have been overemphasized in the research literature.</td>
<td>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.</td>
</tr>
<tr>
<td>Researchers examined a key question, “What does it take to be good at learning?”</td>
<td>A good question!</td>
</tr>
<tr>
<td>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.</td>
<td>No comment . . . I’m eager to read further.</td>
</tr>
<tr>
<td>There are four general social orientations: academic, vocational, personal, and social.</td>
<td>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”?</td>
</tr>
</tbody>
</table>
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 Leamnson’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 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 did not remember the ambiguous material.

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 did not remember the ambiguous material.
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 e-mailed 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


Supporting Faculty through a New Teaching and Learning Center

Charlene D’Avanzo, professor of ecology and director of the Hampshire College Center for Teaching and Learning

Last year, Hampshire College established a new center for teaching and learning (CTL). Since then, identifying areas of focus, designing and carrying out programs, and figuring out how to evaluate our efforts has been tremendously stimulating. The CTL programs target classroom teaching, and it has been rewarding to see that many faculty are eager to learn about colleagues’ responses to challenges we all face and will make time for meaningful discussions. Their willingness to lead and participate in sessions is the foundation for our initial achievements. This article is designed to encourage and offer suggestions to others who are thinking about creating a teaching center—while the original motivations, first steps, and early concerns and successes are still fresh in the memories of the center’s architects. Also, in today’s taxing financial times, the paper may be helpful to colleagues struggling to keep centers they have.

A center for teaching could provide opportunity for ongoing, wider-ranging dialogue

WHY WE CREATED THE CENTER

Continuing discussions and better cross-college communication. By their very nature, nontraditional colleges should foster meaningful discussions about teaching and learning. While that is true at Hampshire, these conversations have typically focused on specific concerns such as first-year requirements or preparing students for the senior thesis. As a result, discussion often ended when a decision was made or a resolution voted on. In contrast, a center for teaching could provide opportunity for ongoing, wider-ranging dialogue. Another issue we wished to address with a teaching center was exchange of ideas across the college. Our interdisciplinary schools do foster discussion within the sciences or social sciences, for example, but sustained, cross-college conversation has not been the norm. We recognized that identifying the right topics and format for our faculty was crucial to meeting this goal.

Retirement of senior faculty and new faculty hires. Another key motivation for establishing the CTL was the growing number of new faculty at Hampshire, the result of long-term faculty retirements at a college created in the early 1970s. We wanted a teaching center to address both sides of this issue—loss of senior faculty members’ “wisdom” and the emerging needs of junior teachers. To address the first, we pondered how to make available the extraordinary experience of teaching at Hampshire to the next generation of faculty. To address the second concern—helping new faculty find their way as teachers—seemed more daunting. For one thing, those of us developing the vision of a teaching center were more senior faculty and administrators. What did junior Hampshire faculty identify as their most pressing needs? We were not sure.

Assessment and evaluation. Another incentive was the greatly increased emphasis on assessment and evaluation in higher education during the last decade or so. Like most college teachers, there is much that our faculty know little about, including formative assessment approaches, institutional data (e.g. NSSE), and national debates about the scholarship of teaching and learning (SoTL). The questions here were many and interrelated. Where should we start? What would faculty be most interested in and
open to? How could we tie the different components of assessment and evaluation together?

Cognition and learning. The last twenty years have brought exciting advances in our understanding of cognition and learning. Since Hampshire was the first college to have a separate department (which we call a school) of cognitive science, applying cognitive research to classroom teaching is of special interest to us. But again, what aspects of the field would be most useful and appealing to faculty? Metacognition? Cooperative group research? Would we find researchers who could effectively integrate cognitive and education disciplines for our faculty?

FIRST STEPS

Interviewing faculty. As CTL director, my first step was to interview about 20 percent of regular faculty, with particular emphasis on more junior professors. This, I anticipated, would increase faculty buy-in for the center’s activities and provide essential information about activities in which teachers were more likely to participate. The questions were straightforward: (1) How might a teaching center help you? and (2) What specific topics would you like the center to focus on? The interviews were extremely useful and helpful—and they confirmed that establishing a center now at Hampshire was timely and needed. Faculty were enthusiastic about the idea and senior professors readily agreed to facilitate discussions. Since many identified similar topics (table 1), programmatic focus developed naturally as the interviews progressed. A few issues (e.g. challenges to authority in the classroom), were particular to newer faculty, however, indicating the need for a distinct program for these teachers. Most of these topics are universally important for college faculty although some, (such as writing evaluations and finding coteachers) are more particular to Hampshire.

Talking to directors of other CTLs. A second essential early step was finding and talking to effective directors of other centers. I had many pressing questions. How can we ensure good faculty participation? How do we make best use of a Web site? How do we find good evaluators? What meetings should I attend? I was fortunate to have a very well-known founder of a teaching center, Mary Deane Sorcinelli, literally right up the road in Amherst, Massachusetts. Hampshire is part of the Five Colleges, Inc., a consortium that includes the University of Massachusetts–Amherst (U Mass). I had already worked with Sorcinelli on a previous project when she ran the award-winning center for teaching at U Mass. (She is now associate provost for faculty development.) I recommend that any new teaching center director seek the advice of as experienced administrator such as Sorcinelli, who was very generous with her time (Sorcinelli and Desantis 2007). Another key adviser for me was Michael Reder, who runs Connecticut College’s center for teaching and learning. He offers workshops for new center directors at the Professional and Organizational Development (POD) Network in Higher Education meetings, and his own center serves a small college (Reder 2007). Also giving of his time and very helpful, Reder increased my confidence by letting me know that I was asking the right questions, and he made programmatic recommendations that have worked quite well for us.

As a result of these conversations plus visits to several other teaching centers and consultation with the center’s advisory committee, I decided to: (1) focus on a few efforts initially and do them well, (2) offer one set of discussions for new and untenured faculty only, and another set for all faculty, and (3) give faculty leadership in and ownership of all programs (table 2).

Working closely with key administrators and creating an Advisory Board. The conception of a Hampshire College CTL emerged from meetings with our president, Ralph Hexter, and dean of faculty (DOF), Aaron Berman. As ideas began to crystallize, I met monthly with Berman, who was essential in the planning process and continues to be a strong presence. The CTL is sponsored by the dean of faculty office. In practical terms this means, for instance, that the Web site can be found on the DOF Web page and Berman sends out electronic invitations to each session. Both signal to faculty that their participation is expected, which is essential support. Creating an advisory board of faculty leaders and key administrators (such as our dean of
advising) has also been critical. These faculty act as ambassadors, have excellent ideas, and are ready sources of ongoing support and advice.

INTEGRATING ASSESSMENT, EVALUATION, AND COGNITIVE RESEARCH

As explained above, integrating assessment and evaluation into the center’s activities was a core goal from the beginning. While this is clearly an extensive undertaking, expertise of several key players has been very useful. First, institutional research at the college is well directed by Carol Trosset and Steve Weisler, who work hard to collect and synthesize high-quality information so that faculty understand their students better and make more informed decisions about teaching and learning (Weisler and Trosset 2006). Second, my faculty development work includes helping faculty conduct “scientific teaching” in which faculty ask questions and collect data on student learning (D’Avanzo and Morris 2008). Despite our combined experience, figuring out just how to engage our faculty in meaningful discussion about assessment/evaluation goals and methodology—plus application of research on cognition—has been a real challenge. We are presently using the theme of formative evaluation as a way to tie together essential aspects of evaluation and learning. This includes clearly articulating goals for student learning, evaluating performance based on these goals, examining ongoing student performance, and applying theories about learning to this practice. In addition, we explicitly use institutional research on student learning as the basis for this work. For example:

- **Using Scientific Teaching to Improve Students’ Quantitative Skills and Thinking (QST):** Last spring, twelve faculty from the schools of Natural Science and Cognitive Science worked together to identify and study certain quantitative skills they wished to target in first-year courses; this entailed focusing on specific skills/thinking (such as interpreting figures and tables or understanding simple statistics), developing active teaching approaches to help students improve, creating ways to gauge student progress on these skills (e.g. pre/post tests), and reflecting on findings. The motivation for this project was students’ assessments of their quantitative abilities on several surveys. To participate in the QST group, faculty were required to write a proposal outlining their focus and experimental design, attend three workshops over the semester, meet intermittently in small teams to discuss the project, write a final report, and present their work in public meeting. Figure 1 is an example of the type of pre/post data these faculty collected.

A year later, I interviewed these faculty members to assess longer-term outcomes from participating in the project and to learn what was most valuable to them in hindsight. Although none of the faculty had used recognized formative evaluation methods in the past, all but one had incorporated such approaches into their courses as a result of the QST program. Perhaps this is not unexpected, as all were scientists who like collecting and working with data. Still, their application of formative methodology into their teaching was rewarding to see. Aspects of the project they identified as most important included: simply setting aside the time to talk to colleagues about difficult aspects of teaching; hearing others’ approaches to the QST challenge; working in small teams over the semester; focusing on a single set of skills; receiving formative feedback, and writing the proposal. We are in the process of developing plans for engaging faculty more generally in formative evaluation. One approach is to require professors requesting faculty development support to include plans for ongoing assessment of student progress—and to help them develop these ideas.

### TABLE 2

<table>
<thead>
<tr>
<th>“Talking About Teaching” sessions for Fall 2008</th>
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<tbody>
<tr>
<td>For each discussion, four to five more senior faculty set the stage with suggestions and questions; their names appeared on posters. Sessions were 1.5 hours and on different days and times because we have no shared time for such exchanges. At each session, twenty-five to thirty faculty members from across the college attended. Notes and handouts are posted on the center’s Web site (<a href="http://www.hampshire.edu/academics/85">www.hampshire.edu/academics/85</a>).</td>
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<tr>
<th>Creating Writing Assignments That Engage and Challenge</th>
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<tr>
<td>The design of writing assignments is a key ingredient in the success of any course. This discussion will consider how to pose assignments that draw students into course content, build the skills necessary for advanced work, and provide insight into the working of various discourses. Faculty will leave with specific strategies they can use in their courses.</td>
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<tr>
<th>Helping Students Reach Your Goals and Their Own Expectations</th>
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<td>This session will focus on various ways faculty help students achieve their best in class by developing professional practices, such as coming to class prepared.</td>
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<tr>
<th>Coteaching: Examples of Successful Teaching Relationships</th>
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<tbody>
<tr>
<td>Although Hampshire emphasizes coteaching, for many newer faculty in particular, the nuts and bolts of coteaching seem a little mysterious. How do you find the right people to share coteaching? What aspects are especially challenging and what works? This session features several different coteaching relationships—some brand new, others long-standing. We will see if common themes emerge.</td>
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<tr>
<th>Brining Research on Learning to Faculty:</th>
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<tbody>
<tr>
<td>To help faculty integrate research on learning into their</td>
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</table>

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**To participate in the QST group, faculty were required to write a proposal outlining their focus and experimental design, attend three workshops over the semester, meet intermittently in small teams to discuss the project, write a final report, and present their work in public meeting.**
teaching, we are inviting eminent faculty in fields especially interesting to our faculty to give workshops. Sam Wineburg, professor of education and history and director of the History Education Group at Stanford University, was chosen as the first workshop leader. The session will focus on Wineburg’s research about why it is so challenging for students to learn to think historically—and therefore so difficult for faculty to teach. In a “Point of View” piece for the Chronicle of Higher Education, Wineburg (2003) wrote:

... At some point in our lives, each part of the intellectual process demanded our full concentration. But once learned (or, more precisely, once mastered), our mental habits became so automatic that they faded from view. It is that very point that spells trouble in the classroom. For the same aspects of cognition that ease our job as thinkers pose the greatest threat to our effectiveness as teachers. Our familiar mental habits, often overlooked or omitted when we describe our thinking processes to others, can create a gulf between us and our students.

It will take several years before we are able to gauge widespread effects of Hampshire’s new CTL on faculty teaching and student learning—what our advisory committee calls the “holy grail” of such centers. However, positive evaluation of sessions and high faculty participation are encouraging indicators. Faculty run the “Talking about Teaching” sessions, which are based on their interests and concerns; the center is directed by a veteran faculty member, and evaluations and research target specific aspects of student learning of great concern to them. The vital role of faculty, we believe, is essential to our initial success.

ACKNOWLEDGEMENT
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REFERENCES


*Data collected by Cynthia Gill in first-year class titled Brain Mechanisms to assess students’ skills with graphs at the beginning and end of the semester. Numbers are class averages. This diagnostic test is not used to grade or evaluate specific students but instead provides information about the efficiency of the class in regard to a set of goals. In addition to quantitative information of this sort, faculty also collect formative input with approaches such as minute papers or concept maps. A minute paper is a well-known formative assessment approach in which teachers ask students to address a question, often at the end of a lecture/discussion, literally in a minute. It is a quick and effective way to assess how well students understood a key point, for example.

FIGURE 1

Percentage of skilled answers about graphs at the beginning (pretest) and end (posttest) of semester

<table>
<thead>
<tr>
<th>Question</th>
<th>Pretest</th>
<th>Posttest</th>
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<tbody>
<tr>
<td>Dependent variable?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brain areas tested?</td>
<td></td>
<td></td>
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<tr>
<td>Test groups?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify significant differences?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuous variable labeling?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Conclusion for bar graph?</td>
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<td></td>
</tr>
<tr>
<td>Conclusion for line graph?</td>
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</table>

*Data collected by Cynthia Gill in first-year class titled Brain Mechanisms to assess students’ skills with graphs at the beginning and end of the semester. Numbers are class averages. This diagnostic test is not used to grade or evaluate specific students but instead provides information about the efficiency of the class in regard to a set of goals. In addition to quantitative information of this sort, faculty also collect formative input with approaches such as minute papers or concept maps. A minute paper is a well-known formative assessment approach in which teachers ask students to address a question, often at the end of a lecture/discussion, literally in a minute. It is a quick and effective way to assess how well students understood a key point, for example.
In AAC&U’s 2007 report, College Learning for the New Global Century, the National Leadership Council for Liberal Education and America’s Promise (LEAP) identified a number of innovative, “high-impact” practices gaining attention in higher education. In a subsequent AAC&U report, Kuh (2008) describes strong positive effects of participating in high-impact activities as measured by the National Survey of Student Engagement (NSSE). Specifically, first-year students and seniors who participated in learning communities, service learning, study abroad, student-faculty research, and senior culminating experiences reported greater gains in learning and personal development. These gains included “deep approaches” to learning, which encompass integrating ideas and diverse perspectives, discussing ideas with faculty and peers outside of class, analyzing and synthesizing ideas, applying theories, judging the value of information as well as one’s own views, and trying to understand others’ perspectives. According to Kuh, “Deep approaches to learning are important because students who use these approaches tend to earn higher grades and retain, integrate, and transfer information at higher rates” (14).

In discussing the evidence for the success of these practices, Gonyea, Kinzie, Kuh, and Laird (2008) recommend that all students in higher education participate in at least two high-impact practices, one in their first year and another in their academic major. Yet this recommendation is far from the current reality in higher education. A majority of college students do not have the opportunity to participate in high-impact activities, and, as Kuh notes, underrepresented students—such as first-generation college students and African American students—are far less likely to participate.

Kuh’s (2008) findings about the outcomes of high-impact practices provide colleges with strong reasons to continue the development of these practices on college campuses. They also raise the question of what else we know about the proven outcomes of these practices. In 2008, the authors of this article completed a literature review for AAC&U, researching the proven outcomes of five “high-impact” activities: first-year seminars, learning communities, service learning, undergraduate research, and capstone experiences. We found substantial support for the value of these programs for students in general, and more specifically, for underserved students (underrepresented minority, low-income, and first-generation students). Each practice leads to a range of positive outcomes for students, and for colleges and universities as well. However, it is also clear that the impact could potentially be greater when colleges and faculty take the time to design these experiences carefully, paying attention to each piece of planning and implementation. Designing these activities with an eye to each campus’s own culture and goals will increase the likelihood of strong educational outcomes for all students.

Of the five practices reviewed, much has been written about four of them. For first-year seminars, learning communities, undergraduate research and service learning, there are many published descriptive and prescriptive pieces talking about program elements, advocating for the development of these experiences as a response to current criticisms and challenges in higher education, or providing advice for implementing the activities. There are also many articles and books describing case studies of successful programs. Unfortunately, there has been little attention paid to capstone experiences in the past decade, and almost none of that literature...
looks at student outcomes, including student learning (however, it is worth noting that capstone experiences may fall under the rubric of undergraduate research at many colleges and universities). Therefore, this article will focus on the other four practices reviewed: first-year seminars, learning communities, service learning, and undergraduate research. [For the full literature review, please visit www.aacu.org/inclusive_excellence/Research.cfm.]

OUTCOMES OF HIGH-ImpACT PRACTICES

The most common outcome studied across all four practices is student persistence in a given institution, followed closely by academic performance, usually defined as grade point average. For both of these measures the result is positive: students who participate in these activities consistently persist at a higher rate than those who do not. While the impact on grades is more modest, these activities either have a positive impact on student performance, or at worst a neutral impact. No studies were identified in which participation led to lower persistence or grades when groups of participants were compared to nonparticipants.

Beyond these two indicators, researchers have studied a wide range of behavioral, attitudinal, and learning outcomes. For example, all four practices have been shown to lead to higher rates of faculty and peer interaction. Three of the four lead to increases in critical thinking and writing skills, greater appreciation of diversity and diverse viewpoints, and higher levels of engagement, both in and out of the classroom. Some additional specific outcomes are worth highlighting:

- **Learning communities** help ease the transition to college. Several studies of underserved students have shown that these communities help students build their identities as learners and give them a sense of belonging on campus. Learning communities have also been linked to a host of liberal education outcomes, including intellectual development, integrative thinking, civic engagement, and the development of values and ethics.

- **Service-learning** participants demonstrate gains in moral reasoning, in their sense of social and civic responsibility.

- **Problem-solving and research skills.** Students who participate in service-learning experience, and demonstrate greater commitment to pursuing a service-oriented career. They are also more able to apply class learning to real-world situations.

- **Assessment of the outcomes literature**

While the evidence reviewed shows a clear pattern of the success of these initiatives, there were several problems identified with the current body of literature. First, most studies involve single institutions, programs, or classes. Since each of the high-impact activities varies widely in practice, it is often impossible to generalize research findings, or to identify which program component leads to a particular outcome.

Second, not enough studies move beyond grades and persistence to look at student learning. In Challenging and Supporting the First-Year Student: A Handbook for Improving the First Year of College, Upcraft, Gardner, and Barefoot (2005) challenge colleges to broaden their definition of student success to include a wide range of outcomes, including developing intellectual and academic competence, exploring identity, developing career goals, clarifying their values and beliefs, developing multicultural awareness, and developing a sense of civic responsibility. While some authors have taken on this

We found that there is little research that looks at specific populations of students, and particularly underrepresented minority, low-income, and first-generation students

in the development of a social justice orientation, and in an increased commitment to pursuing a service-oriented career. They are also more able to apply class learning to real-world situations.

- **Students who participate in undergraduate research** are more likely to continue on to graduate school, are more satisfied with their overall educational experience, and demonstrate greater problem-solving and research skills.

Finally, one of the primary purposes of the literature review was to determine whether there was a differential outcome for participants in underserved student groups. We found that there is little research that looks at learning outcomes for specific populations of students, and particularly underrepresented minority, low-income, and first-generation students. Even where demographic data is avail-
able for a study, it is more often used in describing the sample than in analyzing or discussing findings. Therefore, much of what we know about the outcomes for these groups has to be inferred from reading about institutions or specific programs that predominantly serve students from one of these groups, such as community colleges.

**APPLYING THE OUTCOMES LITERATURE TO CAMPUS PRACTICE**

Given these concerns, how can the current literature be useful to campuses who want to improve their practices? While the literature often didn’t permit generalizing findings, this project allowed us to see the wide range of design options available for each campus to consider. No two campuses are the same, so the same practices on different campuses are likely to lead to different results; every program design must take into account the unique culture and goals for the individual campus. So while we cannot say that a four-course learning community always leads to greater positive outcomes than a two-course community, we can point out the importance of considering those options in one’s own program design. This section will highlight the choices that each campus should consider for three high-impact practices: first-year seminars, learning communities, and service learning.

**First-Year Seminars**

The term “first-year seminar” is used to describe a range of class types. The National Resource Center for the First-Year Experience and Students in Transition at the University of South Carolina uses a scheme originally designed by Barefoot (1992) to classify these seminars. First-year seminars can be:

- **Extended orientation seminars**, whose primary goal is to assist students in their transition to college. They typically introduce students to the purpose of higher education, teach students about campus resources, develop study skills, discuss academic and career planning, and address health and wellness issues.

- **Academic seminars with uniform content across courses**, which address the intellectual transition to college over the personal transition. They may address academic skill-building such as writing or critical thinking, but within the context of an interdisciplinary or theme-oriented academic course designed for first-year students.

- **Academic seminars with variable content**, which are similar to the academic seminars above, but are more likely based in a single discipline rather than interdisciplinary.

- **Preprofessional or discipline-linked seminars**, generally taken by students intending to enter a particular discipline or field, and meant to introduce students to and prepare them for the demands of that discipline or profession.

- **Basic study skills seminars**, usually targeting underprepared students and focused on college-level skill development.

While hybrid courses that mix multiple models are becoming more common, extended orientation seminars are still the most common type on college campuses (Swing 2002).

The success of the seminar selected may, logically, be related to the seminar’s ability to meet the needs of the students of a given campus. For example, institutions with many first-generation college students might place priority on teaching their students how to navigate the college environment and will find the extended orientation content most useful. Colleges that have many pre-professional majors might find it more important to offer a seminar that would help new students learn about the expectations and demands of those fields from the start.

In his study of more than 30,000 students and seminar coordinators at sixty-two four-year institutions, Swing (2002) found that not only do different seminar types lead to different outcomes, but also the number of credits the seminar carries affects outcomes. While he found that one credit/contact hour courses were as effective as courses with greater contact at introducing students to institutional policies and practices:

If the course goals also include increased knowledge of campus services, improvement in time management and other study skills, increasing student/student and student/faculty connections, and increased out-of-class engagement, then at least 2 contact hours per week are more effective in producing these learning outcomes. If the course goals also include gains in academic skills and critical thinking, then a three-contact hour course is more likely to produce the desired learning outcomes (Swing 2002).

In addition to number of credits or contact hours, other factors associated with the success of seminars include: (1) the use of instructional teams, bringing faculty, aca-
Academic advisers, librarians, and computing specialists together to support students; (2) the use of engaging pedagogies; and (3) connecting first-year seminars to other high-impact practices, such as learning communities or service learning.

**Learning Communities**

Learning communities also take on many different forms in practice. At their most basic, a learning community links together two classes on a common theme. However, a learning community can link enough courses to make up a student’s full-term schedule. They can include an extended orientation seminar, or a seminar intended to help students discuss the theme and integrate knowledge across classes. Another option is to make a community residentially based to form a living-learning community. The option that is right for a particular campus should again be linked directly to the culture and goals of the college for this community. Faculty availability, classroom size and availability, residential options, and host of other practical factors are a necessary part of any conversation about the structure of learning communities.

In the introductory chapter to *Diversity, Educational Equity, and Learning Communities*, Lardner (2005) describes the importance of intentionality in creating effective learning communities. Citing Malnarich’s (2003) earlier work, Lardner emphasizes that learning communities can be used to target the problematic parts of the curriculum—those gateway courses and “graveyard” courses that act as gatekeepers for student progress. By creating learning communities that lend support to students in the classes where there is a higher risk of failure, rather than creating communities based solely on faculty’s personal interests in collaborative teaching, institutions can address issues of equity and access.

Beyond these practical aspects of learning community design, the faculty’s approach in the classroom is key to the success of learning communities. From a study of multiple learning communities on one campus, Lichtenstein (2005) found classroom environment to be a crucial factor in the success of learning communities. Specifically, Lichtenstein identified three types of classroom environments:

1. **Positive classroom environments (PCEs)** had clear linkages between classes, including shared syllabi and linked assignments, and clear, visible communication between faculty.
2. **Negative classroom environments (NCEs)** were characterized as having no subject matter linkages between classes. Faculty either didn’t interact or were in clear conflict with each other, and the syllabi, grading and assignments were not coordinated. These faculty did not work to prepare students for the academic skills they would need in the future, and were unsuccessful at creating a sense of community among students.
3. **Mixed classroom environments (MCEs)** had mostly positive classroom experiences, but weak or no linkages between the content of the two courses or between grading protocols. There was an emphasis on community building above skill building.

Student outcomes were found to vary between classroom environment types. Students in the PCEs had higher persistence and grades than students in NCEs, MCEs or in no learning community at all. In fact, nonparticipants had higher persistence rates than those in NCEs.

Positive classroom environments (PCEs) had clear linkages between classes, including shared syllabi and linked assignments, and clear, visible communication between faculty.

This study points to the importance of the quality of the learning community experience, and its potential impact on its achieving desired outcomes for students. Therefore, best practices in developing learning communities will necessarily include faculty development; in particular, faculty should be allowed time and resources to create collaborative communities that focus on active and collaborative learning, integrative learning, community development, and skill building. The use of instructional teams, described above for first-year seminars, could also be beneficial in learning communities.

**Service Learning**

The most important aspect of service learning design is ensuring that students’ service experiences are linked directly to classroom learning. This linkage not only differentiates service learning from volunteerism, but also enables students to apply classroom learning in out-of-class settings and vice versa. Structured reflection opportunities are repeatedly cited as
a means to achieve this integration, with faculty helping students to make connections between theory and practice. In addition, there are several factors to consider when developing a quality service-learning experience:

- To be effective, students must have meaningful service experiences, interacting directly with clients rather than simply doing office work.
- The quality of supervision offered at the site is of key importance, and should include regular feedback to students regarding their progress.
- The duration of the experience should be long enough to be meaningful and to allow the development of relationships between students and clients.

Service learning is an ideal activity to pair with other high-impact activities to lead to even greater gains for students, because it is a powerful integrative tool. Eaton, MacGregor, and Schoem (2003) point out that learning communities can provide sustained time and space both to conduct service-learning work and to reflect on that work, and can provide “multiple lenses to examine issues” raised in service learning (4). At the same time, service learning brings experiential learning to the learning community experience. It focuses students on “real” world (unscripted) problems and issues, and broadens students’ thinking about what it means to be a part of a community beyond the campus.

CONCLUSION

The literature review conducted by Swaner and Brownell found that “high-impact activities” live up to their name, leading to a range of positive outcomes for students. The project also showed that with the range of options available for each of these activities, it is advisable for colleges and universities to design programs that fit their own culture and goals.

In implementing these programs, however, institutions also have the opportunity to improve our knowledge about student outcomes by building assessment into their design. Our understanding of outcomes would be enhanced by: (1) the use of more longitudinal approaches and comparison groups; (2) studies moving beyond student persistence to student learning; (3) a mixture of both qualitative and quantitative research methods; (4) clearer descriptions about program components; (5) more attention to outcomes for underserved student populations; and (6) more multi-institution studies, which could be attained through institutional collaboration and consortia. Each of these improvements would increase our effectiveness at designing quality initiatives for our students.

Editor’s Note: An article on high-impact practices by these authors also appears in the spring 2009 issue of Diversity and Democracy. www.diversityweb.org/DiversityDemocracy/index.cfm.

REFERENCES


My Most Important Teaching Tool

Louis Schmier, professor of history, Valdosta State University

As I walked in the crisp morning air, several things were on my mind. Preparing to present a daylong workshop on creating a motivating classroom, I began thinking about a student journal I had recently read. The journal revealed that a professor in another department sees things through the eyes of a self-proclaimed “weeder outer” rather than through the lens of a nurturer. And my mind also pondered a question that had been posed to me by a professor from another institution. “Dr. Schmier,” she asked, “what is your most important pedagogical tool?”

“That’s it!” I exclaimed in a eureka moment on the back leg of my power walk. I rushed into the house, grabbed a cup of steaming coffee, and began writing the answer to her question. “You asked what my most important teaching tool is? Well, it’s me. I have found that I cannot escape the power of my intentions.” After all, it’s our intentions that set our priorities, marshal our resolve, and lay in our course of action. And who I am is the result of the clear, positive, and empowering priorities and resolve nourished by my vision.

My intentions are rooted in my two fundamental outlooks on life, in general, and on each student, in particular. First, when I beat cancer four years ago and survived a cerebral hemorrhage last year, I consciously decided that surviving was not enough for me. I decided I was going to thrive as well. Second, I am a people person—I am enthralled by students. I go on campus determined to improve and honor the lives of ordinary students as anything but ordinary. That is the inseparable linkage between my philosophy of life, my celebration of each student, my vision of my mission, and my teaching methods. I teach each student with conscious and intended unconditional, unlimited, and unending faith, hope, belief, kindness, awareness, newness, challenge, commitment, dedication, perseverance, otherness, and empathy. My vision is to be the person who is there to help them become who and what each is capable of becoming.

For me there are seven key elements of my vision that guide whatever it is I do, in and out of class:

1. The classroom is like my garden. There is nothing that is ever ugly in it. If it is capable of blooming, it stays. Likewise, I believe that there is good, ability, and potential in every student. And, that is worth believing. I’ve never known a student who wasn’t worth the trouble and effort required to make her or his life whatever it could possibly be. I have never found that a student is a headache as long as I keep loving, having faith in, believing in, and having hope for that student, and if I am helping her or him to become the person she or he is capable of becoming. So, my head never aches when I am supporting, encouraging, or comforting a student.

2. I know I must know and believe that I have the therapeutic power to be that nurturing person in a student’s life.

3. I know that a student’s sense of belonging, security, and self-confidence in a classroom provides the scaffolding for deep learning beyond grade getting.

4. I believe every student comes on campus with a desire to learn, though she or he may not know how to do it.

5. I believe that students will be more responsive and motivated to learn when I create a safe, trusting, and secure environment in which all students feel comfortable, valued, and noticed.

6. The classroom is a shop of “serious novelties” and adventurous “let’s see what happens” experiments that tap into students’ unused strengths. To keep myself and students fresh and sharp, the classroom has to be washed each day with breezes of crisp, fresh air; that is, we must never get into a predictable, old-hat, stagnating, repetitive, and mind-numbing routine. New ways of looking at, thinking about, and using both the material and ourselves must be the rule of each day.

7. I accept that most of my students are not adults; that no student is perfect; that good people will occasionally lapse; that things do not always go the way I want or expect; that nothing is quick and easy; and, that nothing works 100 percent all the time.

“There is both an ‘I’ and ‘we’ in teaching and learning,” I wrote to my colleague. “And I, like you, am my most important and powerful teaching tool.”
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