

Essays on Teaching Excellence

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But How Do We Get Them to Think?

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Whether we call it critical thinking, problem solving, analytical reasoning, or creative thinking, faculty members in all disciplines and at all levels of higher education share a common goal: we would like our students to be able to perform the complex mental operations that will allow them to be successful in our classes as well as their future careers. While improving our students' thinking skills is a clear goal, there seems to be no single recipe that will succeed for each of us and for our particular students. It is apparent, however, that at least two main ingredients are essential: we must convince students that improving their thinking skills is necessary, and we must teach students the thinking skills that they need.

How do we convince students that improving their thinking skills is necessary? Instructors of upper-level undergraduate and graduate students may not need to ask this question. Instructors who attempt to teach thinking skills to beginning-level college students, however, often encounter the plea "Just tell me what you want." Students who are at the dualistic level of intellectual development described by Perry (1970) regard us, their instructors, as the ultimate authorities. These students often consider the development of their own thinking skills to be at best a "frill" and at worst an intrusion in the REAL substance of learning as they conceptualize it.

- *Show how thinking and learning are connected.* One effective

method of convincing our student skeptics that thinking and learning are inseparable processes is to emphasize from the beginning that our course has two complementary goals: to promote knowledge of the subject and to develop thinking skills. We can then demonstrate how thinking skills are used *for the purpose of* learning the subject. For example, we can assist our beginning-level students in developing strategies to pick out the major concepts or the most relevant information as they approach a section of text. If, as a result of practicing this skill, students' performance on tests and assignments in the course improves, their doubts about the importance of learning thinking skills will diminish. In addition, we will have helped them learn an ability that they will need in future courses: identifying the most important points in a chapter of an introductory biology textbook, for example, calls for many of the same thinking skills that identifying the salient issues in a case analysis demands in an upper-level or graduate course.

- *Create a sense of "mental disequilibrium."* This is another technique for motivating students at all levels to think about course content rather than merely to memorize it. At the beginning of each class, pose a problem or raise a controversial issue related to the day's readings and/or class activities. Then spend a few minutes at the end of the class soliciting students' ideas about how the problem or issue might be addressed. Students can work individually or in groups and can be asked to present their ideas either orally or in writing. This brief exercise will give students the opportunity to practice applying their knowledge and will also hold them accountable for doing so. The technique has two additional advantages; first, raising a question or issue in advance helps students by giving them a focus or framework for organizing the material that emerges during the class session. Second, student responses at the end of the class help you by giving immediate feedback about how well they grasped and applied the concepts introduced.
- *Assess thinking as well as content knowledge.* Assignments and examinations probably constitute the most powerful means of persuading our students that thinking skills are a necessary component for success in our classes. (Is there any college

instructor who has not been confronted with the query "Will this be on the test?"). If we are serious about encouraging our students to think more effectively, we must ask them to demonstrate both knowledge of content and mastery of thinking skills.

There is no one "correct" type of assignment or examination question for this purpose. Term-paper assignments can be structured to guide even beginning-level students beyond summarizing the research and ideas of others into offering and justifying their own ideas and conclusions.

Multiple-choice and short-answer test questions, if carefully constructed, can require students to go beyond lower-level thinking skills of recall and recognition of factual information (Bloom, 1956) into application and analysis. For example, after reading a paragraph describing the situation faced by a manufacturing company, students answering a multiple-choice question in economics are asked to select the response that will allow the company to maximize profits. In order to arrive at the correct answer, students must be able to choose and apply relevant rules and calculations to the situation described (Cameron, 1991). Another way to make multiple-choice tests into more thought-stimulating exercises is, for a few selected questions, to have students describe their reasons for choosing or not choosing each answer (Statkiewicz and Allen, 1983).

Because essay-type questions and assignments ask for open-ended response, they are useful for assessing higher level thinking and problem-solving skills. Essay questions are not without their pitfalls, however; a weighty question that appears to call for students to demonstrate sophisticated thinking skills may actually ask for a reiteration of information covered in class. The most effective question or assignment for assessing thinking skills is one that provides opportunities for students to use course-related knowledge and skills in a new situation or on a problem that they have not encountered before (Hart, 1989).

How do we teach our students the thinking skills they need? A detailed answer to this question is beyond the scope of this article; however, the following ideas can be useful for instructors in all

disciplines.

- *Model our own thinking processes.* This is one very powerful, but often overlooked, technique. Our students are often intimidated by us, convinced that we were born competent in our subject area. We reinforce that illusion when we come into class time after time and unerringly analyze problems or issues in a definitive way that leads inevitably to the correct or most plausible solution. Most students have no idea how long it has taken us to reach our current level of competence. One writing instructor came upon a dramatic way to demonstrate that good prose does not flow magically from the author's brain onto the printed page. His students had been resisting the revision process. After asking them to read a published short story of his own, he brought to class a wastebasket overflowing with crumpled early drafts of that story. The whole atmosphere of the class changed: seeing the physical evidence of their instructor's struggles gave the students the courage to begin revising their own work. While many of us lack such tangible artifacts of our own past endeavors, we can occasionally work aloud through a problem or issue that is new to us. This will give students a more realistic picture of the mental efforts we must put forth when we approach novel problems or material: "Well, that seemed to lead to a dead end, so I better back up and see what happens when I do this..." We can point out the actual steps in our thinking process as we go along: "At this point I usually try to think of the different ways I know to approach problems like this..." In this way we can provide our students not only with answers, but also with valuable insights into our own individual and discipline-related thinking processes.
- *Have students work together.* We can build on the previous suggestion by giving students a problem or issue and asking them to work in pairs. one partner thinks through the problem aloud, while the other partner encourages accuracy and thoroughness by asking questions such as "Why did you take that particular step?" or "Can you explain that in more detail?" (Whimbey and Lochhead, 1986). In addition to involving the entire class in active participation, asking students to work

aloud transforms thinking into a visible operation that can be more readily evaluated. This technique can help students learn how to monitor the effectiveness of their own thinking processes, so that they are no longer dependent solely on us for feedback.

- *Give many practice opportunities.* Students do not automatically apply thinking skills they have learned to other problem situations even in the same class, much less to other courses (Salomon and Perkins, 1989). Whatever thinking skills we emphasize, it is critical to give students many opportunities to practice applying those skills to a diversity of course-related issues and problems.
- *Collaborate with colleagues.* As stated above, college students seem to have difficulty transferring thinking skills from one setting to another. We can work with faculty members in our own and in other disciplines to identify thinking skills common to our courses. We can then build into the courses assignments that will reinforce students' use of those skills in a variety of classroom and clinical situations.

If we take the time to teach thinking skills, how will we cover all of the content? Most of us are reluctant to omit, condense, or defer teaching any part of the discipline to which we have dedicated our professional lives. It may help us resolve the dilemma, however, if we view the teaching of thinking skills as an exchange, rather than as "giving up" something. We will be trading a small amount of course content for skills that will foster a deeper understanding of the discipline and that will allow our students to continue learning long after they have left our classrooms.

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