TOWARD IMPROVING THE LEARNING PROCESS

by

Dr. Alexander T. Wells
Adjunct Professor
Embry-Riddle Aeronautical University
College of Continuing Education, Fort Lauderdale Center
Brilliant, motivated students are fun to teach. They love to work, want more of it, and sometimes even overwhelm you with their enthusiasm for learning. But today's classes are not overcrowded with such paragons. Often unmotivated or distracted students, who don't learn even when we are at our scintillating best, sit in our classes. Professors may exhort them to try harder, but if exhortation fails, what can lead to success?

Research and theory in cognition and motivation offer some practical applications that can help students perform more effectively in college. Cognition deals with how people think and with the complex stages of thought that children and adults pass through. Motivation deals with the driving forces behind human behavior and with people's thoughts about themselves.

Research in these areas has produced a portrait of the underachieving student. According to this research, poor students often do not process educational material well. They are distractible, often anxious, unable to schedule or organize their work, and they have poor test strategies. Often, they do not find the work intrinsically interesting. And their beliefs about themselves discourage attempts at excellence.

These students are not educational mysteries. Enough is known about them to improve their educational performances.

Research at the University of Michigan (McKeachie et al., 1986) has shown that students can readily learn to change their methods of study and raise their educational achievements. The task is to teach students specific skills and ways of thinking that will address their cognitive or motivational problems.

These strategies for learning work best when they are direct and explicit. One must pinpoint targets—for example, a student's anxiety while preparing for tests—and tell students precisely what to do to cope with each problem. Research has shown that people can change problematic behaviors if they are given clear instructions on how to do it (Watson & Tharp, 1985). Other improvements can result from specific changes in the class environment or course structure. This paper focuses on both direct and indirect tactics professors can use to help students develop college-level cognitive skills and motivation.

Many professors are already overloaded with material to cover, and one hesitates to recommend anything else. But helping students develop college skills and motivation is the best way to ensure that teaching is complemented by skills and attitudes that enable students to absorb the material. These procedures really work: try them out before evaluating them. Some of the techniques suggested will require extra class time to present and discuss, but
Assisting Students in Processing Information

For many students "studying" takes the form of marking up a textbook with an overliner, yellow or orange, or underlining passages the old fashioned way. While this approach is a boon to publishers because it destroys the used value of the text, it does very little to help learning because it does not help organize or integrate ideas. Yet this integration is the basis for the complex thinking we hope to instill in college students.

Of course, some students do integrate ideas, but others do not. Recent reviews of the literature suggest that an important difference between these two types of students may simply be the learning strategies they employ (McKeachie et al., 1986). Some students habitually use methods of learning--for example, overlining--that access only the surface of the material. The reader gets the words and first-level ideas, but overall organization, relationships, and deeper points are missed. If the student learns at a deeper level of understanding, he or she is more likely to remember and use the ideas later.

It would be too easy to assume that lack of complex understanding by a student is due to an innate lack of intelligence or developmental readiness for certain kinds of thought. A good deal of recent research suggests that through acquiring a knowledge base in a specific field and by organizing and reorganizing that knowledge, one develops more complex thinking capabilities (Schoenfeld & Hermann, 1982; Bransford et al., 1986).

For example, suppose in the middle of a lecture a graduate assistant walks in and announces: "I have just finished my thesis research, and I have discovered that . . . ." Then he or she cites some important fact, principle, or study. Who will more likely remember this fact correctly a week later, the professor or the students? Most likely, the professor. Why? Not necessarily because he or she is smarter. Through education the professor has formed a mental map, a filing system, a computer program--choose your metaphor--for a large knowledge base in his or her field. And into that filing system the new information can be placed, related to other information, and even assimilated. The students, on the other hand, have no such knowledge base. For them, the graduate assistant's discovery is an isolated piece of information.

Learning brings with it a system for organizing material and holding it in memory. It is this idea and ability that students need to learn: to retain material, they need to organize it and perceive its organization. Francis Robinson's (1970) SQ3R method of studying enables students to learn more deeply and efficiently. Research has shown that students who learn and employ the method perform better academically (Pauk, 1984).

Of course, some students have a tendency to dismiss any proposed changes in their study procedures, so in teaching the SQ3R method the instructor should ask students to try it, then evaluate it. If it doesn't work for them, they can always go back to their old methods. Further, the SQ3R method is more likely to benefit students if they understand why it will help
their learning. Thus, it helps to explain the idea of looking for relationships, not just memorizing independent facts.

Under the SQ3R method, students break material to be studied into units convenient for them, for example, a five-page segment of a text. For each unit, they carry out the SQ3R procedure. The letters stand for Survey, Question, Read, Recite, Review.

Survey. First, students spend about two minutes reviewing or creating an outline of the material to form a framework in their minds.

Question. They ask themselves one or two questions about the material to create interest.

Read. Then they read, taking only a few notes of important points and hardly overlining at all.

Recite. The student closes the text and recites, out loud or on paper, the main points of the text. This recitation is the point at which actual learning occurs, in which material is organized and stored in memory.

Review. They check their recitations against the text and read and recite again if they made errors.

This procedure may seem cumbersome at first. But if students build it into their study habits one step at a time, it can have profound effects on their school performance. Students should also be alerted to the fact that some materials can be studied quickly, while others will require several passes with the SQ3R procedure.

The instructor should teach, illustrate, and reinforce these strategies in class presentations, beginning by putting the outline for the lecture on the board.

There are several other ways students can be helped to learn more effectively. Do they prepare for classes beforehand? Do they test themselves to see if they know important material?

One doesn’t want to badger students, but telling them how to be good students is hardly badgering. After all, professors review material before class.

The instructor should also encourage students to be active learners and translate new information into their own experience, using their own words. When material can be personally related to a student’s personal experiences, it is more easily learned and better retained.

For example, taking notes in one’s own words produces better learning. Once a concept has been explained to students in the usual way, ask them to recapitulate the concept in their own words. Through examples and direct instruction, they should also be encouraged to think about how new material relates to material they have already learned. An instructor can develop a model for this approach by asking students, "How does this new idea, Y, fit in with what we learned earlier of Z?"

Teaching Students to be Better Organized and Less Distractible

Many students know they would be more efficient if they scheduled study time and that cramming for tests at the last minute is not the best way to learn. But there are many temptations to interfere with scheduled studying. "I don’t have the self-control for it" is a common student complaint, as well as, "It’s boring, so when something more interesting comes up, I do it instead."
Research in the development of self-control has shown that it is possible to teach students to have greater self-control when it comes to studying. This kind of research has been conducted for many years, and there are several steps known to be effective in developing self-control (Watson & Tharp, 1985).

First, goals must be specific. Not, "I'm going to study more," but, "I'm going to study on Thursday nights from 8:00 till 9:00."

Second, the student should keep track of time on target. That is, in the period from 8:00 till 9:00, how much time was actually spent studying, versus daydreaming, watching TV, and so on? Poorly performing students spend much less time on target than do better students. Time on target should be gradually increased.

Third, there has to be a plan for coping with temptation. Suppose a friend calls or one suddenly has an urge for a beer? One, students can use self-instructions: They tell themselves not to give in to the temptation. "I'm not going to call John right now, not until I finish my study time" (Don't laugh, this really works.) Successful students sometimes write down instructions to themselves--reminders of their goal to do better in college, or instructions not to give in to particular temptations. Two, temptations can be used to reward the act of studying. First study, then go get a beer. Anything that tempts one can be used to reward performing something else first.

Fourth, concentration is much easier if the student studies at the same, quiet place most of the time, without socializing with friends. A fully specific goal, therefore, would be, "I'm going to study on Thursday nights at the library at my favorite table from 8:00 till 9:00."

Fifth, all steps aimed at improving study habits should be developed in a series of successive approximations. The SQ3R study method, for example, is much more likely to be used if the student tries to implement it one step at a time. One of the greatest reasons for failure to increase study time is that the student who has been studying, say, two hours a week suddenly makes plans to study 10 hours per week. This almost always leads to failure, and the student lapses back into bad study habits with no improvement at all. This can easily be avoided by following two rules: Start at a much lower level than the final goal, and move up toward the goal in small steps. The student should start just above his or her present level of performance. The two hour per week person should start at two and a half hours. Students who can only concentrate for 20 minutes should begin by asking themselves to concentrate 22 minutes. The importance of this concept cannot be overstressed: Most failures in self-control are due to asking too much of oneself too soon.

Coping With Anxiety

Many students perform poorly because of anxiety about tests and evaluations. Indeed, fear of failure may be one of the major reasons students drop out of college (Blumenstyk, 1991). Signs of anxiety include tenseness, worrying, or being easily discouraged. Students who are overly anxious actually spend less time thinking about the material during a test than do those who are less anxious (Dweck,
1986). And they spend more time worrying. They also study less, for worrying about failure makes them tense, and this unpleasant emotion can be avoided by avoiding the work.

Early theories in psychology emphasized the role of emotion in producing thoughts, and later theories emphasized the role of thoughts in producing emotions. Today, it is thought that the process works both ways. This means that whatever the original impetus to anxiety, it is possible to control it with tactics aimed both at the emotion and at the thoughts.

Pressuring students who are test anxious to prepare better will probably not lead to better preparation. It’s not simply that they are anxious because they are not well prepared. Whatever the initial cause of their anxiety, it now has become conditioned and is the first cause of their poor performance. Poor performance, of course, will lead to further anxiety, so a vicious circle has been established.

There are things an instructor can do to be helpful (Hill & Wigfield, 1984). First, test-anxious students perform much better on tests that are not timed, so whenever possible give untimed tests. Test-anxious students prefer to perform slowly and cautiously. Second, use instructions for tests that minimize the evaluative or competitive nature of the test. Introducing a test by saying, "Today we separate the men from the boys," may merely separate the anxious from the relaxed. Third, it is true that one good way to overcome anxiety is to be well prepared, so teaching better study habits helps. Typically, highly test-anxious students do not employ good study skills. Fourth, if one can evaluate students on their effort as well as their achievement, test-anxious students will try harder and some will begin to show more achievement. Fifth, giving a practice test helps particularly if the type of material is somewhat new to students. Sixth, giving several major tests and a number of quizzes during the term takes the pressure off each individual test and reduces test anxiety. Seventh, teach "thought stopping" (Watson & Tharp, 1985). In an exam, test-anxious student’s thoughts usually are directed at their anxiety, rather than the material. Thoughts, however, are somewhat controllable. A relatively new mental technique called thought stopping has been shown to be effective in enabling people to stop obsessive ruminations or panicky thinking. The person simply shouts "Stop!" in the mind, takes some deep breaths to relax, tells himself or herself to concentrate on the material at hand and to go back to work. It will take a few practice sessions to perfect this, but it really does work.

Eighth, teach test-taking strategies. Research (McKeachie et al., 1986) has shown that test-anxious students perform better on tests if they are taught these tips: Tell yourself to relax before the test begins, and use thought stopping if you are dwelling on thoughts of failure; pay attention to the instructor, and read instructions slowly and carefully; do the parts of the test you know first; if you finish a section early, check your answers again; don’t worry if you can’t do some of the problems, as many tests have some very hard problems; if you can’t answer a problem and it is taking too much time, move on to the next; don’t rush, but work at a moderate rate; pay close attention to the work--don’t think about other things;
keep track of where you are on the page by keeping one hand on the spot. Teaching these ideas to students has been shown to improve their test performance.

Motivating Students

Theorists such as Freud, Maslow, and the humanists thought of motivation as primarily internal, standing separate from thought, perhaps even energizing thought. And many of us think of motivation as some form of energy or drive, something that springs internally from the person. People may differ in their ideas of the source of this drive—the unconscious body chemistry, past history, or emotions—but the energy that drives the machine clearly lies within a person. This implies that attempts to increase motivation must be attempts to increase the energy level of the machine. Or, we can attempt to induce the machine to direct its already existing energy in certain ways.

Just as the old, static concept of intelligence gives little hope of changing students' cognitive structure, the solely internal conception of motivation also gives little hope of changing it. One can try to arouse motivation, or hope to direct it, but it remains a mysteriously developed mental drive that one only wishes students had to a greater degree. But this is only one way to think about human motivation, and it is not based in the most recent theory and research, which reveals a closer connection between thought, motivation, and the environment.

Changing Motivation by Changing the Course Structure

The kind of course structure and class environment provided by an instructor affects students' motivation. This does not refer to whether the professor smiles or not, or learns the students' names or not, though being warm in those ways will increase the chances they will want to learn the course material (McKeachie et al., 1986). I am talking about how active students are in the learning process, and how much control they feel they have over the process.

These factors affect whether the students' motivation is primarily extrinsic or intrinsic. The dichotomy between extrinsic and intrinsic motivation can be overdone, for one blends into the other. But the basic separation of concepts is worthwhile, for it points out a difference in educational approaches that can have important effects.

A student who is extrinsically motivated is oriented toward achieving success as measured by external circumstances. He or she is geared toward competitive grades, distribution requirements, a teacher's praise, or a good job. Intrinsic motivation can be seen as based within the person, centered in each person's needs to feel self-determining and competent. Students who are intrinsically motivated prefer challenging tasks to easy ones, are more likely to work primarily to satisfy their own interests, and evaluate their success or failure by internal standards rather than those of others. Intrinsically motivated students show more persistence in their work, have less fear of failure and test anxiety, show more curiosity and creativity, think more complexly, and readily transfer their learning to new situations (Deci & Ryan, 1985). These are the qualities professors want to develop, so the challenge is to produce intrinsically motivated...
students.

There are several steps an instructor can take to increase the intrinsic motivation of students. One should continuously show how the material is related to what the students already know and to life outside the classroom. A teacher might have students discuss the historical, economic, ethical, or social implications of what is being learned, or simply make comparisons between the subject matter and events outside the class.

Structure the class work so that students actively participate in their learning. For example, research shows that students who learn material in order to teach it to others have a better grasp of the material, enjoy the learning process more, and are more motivated to continue learning (Pintrich et al., 1986). Participating in discussions, trying to synthesize ideas, teaching each other, doing projects outside class, working with each other on projects or cases—all these will increase intrinsic motivation.

Students are more likely to develop intrinsic motivation if they feel they have some control over their learning. For example, the way grading is handled is important. Grades can be used in a controlling, carrot-and-stick manner, in which the instructor tries to motivate through offering rewards for good work and punishment for bad. To students this often appears an effort to control their behavior. The biggest problem with this approach is not merely that the instructor will not always be present to goad or reward the students, but that it destroys intrinsic motivation. Students may comply and do the required work, but their motivation is primarily extrinsic. When the carrots and sticks are taken away—when the students are no longer in the course—they will no longer be interested in the material even if their interest was originally strong (Deci & Ryan, 1985).

If, on the other hand, grades are used primarily as feedback about the student's level of performance, the students tend not to perceive this as an attempt to control their behavior, but simply the instructor letting them know at what level they are performing. They are more likely to want to learn the material and to use it beyond the end of the course.

There are concrete ways to help students see evaluation as feedback rather than control. Discuss test questions fully upon returning them, make informative or questioning comments rather than "good" or "poor" on papers, return papers and exams quickly so the students can make immediate use of the feedback. Using a flexible grading curve based at least partly on predetermined standards, rather than just a certain percent of A's or C's, will lead to greater student focus on learning and less on "beating" a certain percentage of the class.

There is also evidence that simply reminding students of their intrinsic interest makes it more likely they will be motivated by curiosity or desire to master the material (Porac & Meindl, 1982). Asking them what part of an assignment they found most interesting, telling them they will feel good when they master a certain concept, and setting an example of the curiosity and excitement you feel can help to keep intrinsic reasons for learning—rather than grades—in their minds.
Students’ Thoughts About Their Performance Affect Later Performance

What is it like to receive a C—or worse, an F—for one’s work? Instructors may have to think a minute: What does one think about oneself after receiving a negative review of one’s work? Of course, the student feels bad. Beyond this, people typically try to explain unwanted or unexpected outcomes to themselves.

Research into people’s explanations of their own and others’ behavior reveals several dimensions that can be used to explain unexpected or bad outcomes (Weinger, 1986). One dimension is that of internal or external causation. ("It’s my fault," or "It’s not my responsibility.") A second is the stable-unstable dimension—something that can or cannot change over time. A third is the controllable or uncontrollable dimension ("I can or cannot do something about it"). Typically people will use one or the other of these kinds of explanations to rationalize their own behavior: "I failed because I don’t have the ability" (internal, stable, uncontrollable), or "I failed because I didn’t try hard enough" (internal, unstable, controllable), or "I failed because the professor grades too hard" (external, stable, uncontrollable).

Many students entering college today have been used to easy success in high school. In some cases their secondary schools did not train them for the effort necessary for college work. Faced with college standards, they perform poorly for the first time in their lives. Because they have always explained their good performance by their innate ability, they now explain their relative failures the same way. The danger is that they see no alternative explanation. Because they think the tests they fail measure innate, not developed ability, they believe their efforts have been enough. And they can come to believe that they lack ability or have relatively low intelligence.

Other students may know that they have the ability, but blame their failures on circumstances outside of their control, such as the instructor’s overly high standards, or a roommate’s interference. These failing students do not recognize that their effort may be the crucial factor and that it is a controllable factor.

In my experience, college students making a grade of C or below seriously underestimate how much studying time was put in by students making an A. They thought the A student’s grade must be due to superior ability. They couldn’t believe that the A students were studying three times as much as they were.

If students habitually believe that their failure is due to something out of their control, then there is little point in exerting more effort. Beyond this, these same students often see success as just good luck—an easy test (and uncontrollable)—so that when they have tried hard, they don’t reward themselves for their effort. Their failures reveal their inadequacies, their successes, their luck. (In thinking about how these students think, one has to realize that they do not think about success the same way someone as successful as an instructor does.) These students eventually learn to avoid all academic challenges for fear of failure.

There is no reason to allow these students to continue in what may be
erroneous beliefs. One can routinely suggest to students who are not doing well that perhaps they need to put in more effort and that the ability develops as one works on a task (Dweck, 1986). If they feel they are trying, find out how much time they spend studying. In my experience, many students who say they are working enough are not, at least not when compared with other students. It's hard for them to get started when studying, and when they do, they quit too soon. It is also likely that their study skills need developing, that they are inefficient in their approach to learning.

The major point is that changing the way students think about their own successes and failures—their explanations—affects their future performance (Fostering, 1985). If a student believes he or she has no ability, or that luck is against him or her, there is little point in trying. But if students think they just didn't try hard enough, there is room for trying again. The instructor can aid students just by pointing this out and by helping them develop strategies for success. Their increased effort, for example, should be directed at a goal that they have a good chance of attaining. If the task is structured for them, it helps them gain the experience of success, which will reinforce the increased effort required to perform the task. This does not mean that one should provide constant success or tasks that are too easy. The student needs to learn to face challenges with the new attitude, not simply to succeed.

**The Professor's Motivation to be Helpful**

Motivation is situational. The decision to undertake and persist in any activity involves both the expectation that one can succeed and the value that it is worth the effort and risk. This analysis applies to instructors as well as students (Bess, 1982). But do instructors really think they can change students' skills and motivations, and do they value that goal? If instructors think poor students lack innate capacity or are not cognitively developed enough to master challenging material, they encourage students' expectations of failure. If an instructor assumes that a student's lack of curiosity about the material is due to apathy or overemphasis on vocational success, then he or she will not try to change the student's values about learning. On the other hand, if an instructor heeds what research shows on the capacity of people to change, then specific actions can be taken to help students develop the skills and attitudes that promote learning.

A few years ago I began doing some of the things I suggest here. I stopped simply exhorting students and began to teach them how to improve their study skills and motivation. Since that time, I have spoken to a number of students who have told me that they have improved their performance by using the learning skills discussed in this paper. If you want to change some lives, try out these ideas. If you don't like them, you can always drop them.
BIBLIOGRAPHY AND REFERENCES


Toward Improving the Learning Process

National Center for Research to Improve Postsecondary Teaching and Learning. School of Education, University of Michigan, Ann Arbor, MI.


