

Motivating Students

Intrinsic Motivation

Intrinsic motivators include fascination with the subject, a sense of its relevance to life and the world, a sense of accomplishment in mastering it, and a sense of calling to it.

Students who are intrinsically motivated might say things like the following.

- “Literature interests me.”
- “Learning math enables me to think clearly.”
- “I feel good when I succeed in class.”

Advantages: Intrinsic motivation can be long-lasting and self-sustaining. Efforts to build this kind of motivation are also typically efforts at promoting student learning. Such efforts often focus on the subject rather than rewards or punishments.

Disadvantages: On the other hand, efforts at fostering intrinsic motivation can be slow to affect behavior and can require special and lengthy preparation. Students are individuals, so a variety of approaches may be needed to motivate different students. It is often helpful to know what interests one’s students in order to connect these interests with the subject matter. This requires getting to know one’s students. Also, it helps if the instructor is interested in the subject to begin with!

Source: Matt DeLong and Dale Winter, *Learning to Teaching and Teaching to Learn Mathematics: Resources for Professional Development*, Mathematical Association of America, 2002, page 163.

Extrinsic Motivation

Extrinsic motivators include parental expectations, expectations of other trusted role models, earning potential of a course of study, and grades (which keep scholarships coming).

Students who are extrinsically motivated might say things like the following.

- “I need a B- in statistics to get into business school.”
- “If I flunk chemistry, I will lose my scholarship.”
- “Our instructor will bring us donuts if we do well on today’s quiz.”

Advantages: Extrinsic motivators more readily produce behavior changes and typically involve relatively little effort or preparation. Also, efforts at applying extrinsic motivators often do not require extensive knowledge of individual students.

Disadvantages: On the other hand, extrinsic motivators can often distract students from learning the subject at hand. It can be challenging to devise appropriate rewards and punishments for student behaviors. Often, one needs to escalate the rewards and punishments over time to maintain a certain effect level. Also, extrinsic motivators

typically do not work over the long term. Once the rewards or punishments are removed, students lose their motivation.

Source: Matt DeLong and Dale Winter, *Learning to Teaching and Teaching to Learn Mathematics: Resources for Professional Development*, Mathematical Association of America, 2002, page 163.

Furthermore, research indicates that **extrinsic rewards can have a negative impact on intrinsic motivation**. In one series of experiments, psychologist Edward Deci had two groups of college students play with a puzzle called Soma. One group of students was paid for each puzzle they solved; the other wasn't. He found that the group that was paid to solve puzzles stopped solving puzzles as soon as the experiment—and the payment—ended. However, the group that wasn't paid kept solving the puzzles even after the experiment was over. They had found the puzzles intrinsically interesting. Deci argued that the group that had been paid to solve puzzles might have found the puzzles intrinsically interesting as well, but the extrinsic, monetary reward had reduced their intrinsic interest.

Source: Ken Bain, *What the Best College Teachers Do*, Harvard University Press, 2004, pages 32-33.

Effects of Motivation on Learning Styles

- **Deep learners** respond well to the challenge of mastering a difficult and complex subject. These are intrinsically motivated students who are often a joy to teach!
- **Strategic learners** are motivated primarily by rewards. They react well to competition and the opportunity to best others. They often make good grades but won't engage deeply with a subject unless there is a clear reward for doing so. They are sometimes called "bulimic learners," learning as much as they need to do well on a test or exam and then promptly forgetting the material once the assessment is over. Handle strategic learners by avoiding appeals to competition. Appeal to their intrinsic interest in the subject at hand. Design your assignments (tests, papers, projects, etc.) so that deep engagement with the subject is necessary for success on the assignments. Do so by requiring students to apply, synthesize, or evaluate material instead of merely comprehending or memorizing material.
- **Surface learners** are often motivated by a desire to avoid failure. They typically avoid deep learning because it they see it as inherently risky behavior. They will often do what it takes to pass an exam or course, but they won't choose to go beyond the minimum required for fear of failure. Handle surface learners by helping them gain confidence in their abilities to learn and perform. "Scaffold" course material and assignments by designing a series of activities or assignments that build on each other over time in complexity and challenge. Encourage these learners often and help them reflect on what they've learned and what they've accomplished.

Source: Ken Bain, *What the Best College Teachers Do*, Harvard University Press, 2004, pages 40-41.

A Model of Intrinsic Motivation

James Middleton, Joan Littlefield, and Rich Lehrer have proposed the following model of intrinsic academic motivation.

- First, given the opportunity to engage in a learning activity, a student determines if the activity is one that is known to be **interesting**. If so, the student engages in the activity.
- If not, then the student evaluates the activity on two factors—the **stimulation** (e.g. challenge, curiosity, fantasy) it provides and the **personal control** (e.g. free choice, not too difficult) it affords.
- If the student perceives the activity as stimulating and controllable, then the student tentatively labels the activity as interesting and engages in it. If either condition becomes insufficient, then the student disengages from the activity—unless some extrinsic motivator influences the student to continue.

- If the activity is repeatedly deemed stimulating and controllable, then the student may deem the activity interesting. Then the student will be more likely to engage in the activity in the future.
- If over time activities that are deemed interesting provide little stimulation or control, then the student will remove the activity from his or her mental list of interesting activities.

The challenge, then, is to provide teaching and learning activities that are both stimulating and offer students a degree of personal control.

Source: James A. Middleton, "A Study of Intrinsic Motivation in the Mathematics Classroom: A Personal Constructs Approach," *Journal for Research in Mathematics Education*, Vol. 26, No. 3, pages 255-257.

Strategies for Motivating Students

Following are some research-based strategies for motivating students to learn.

- **Become a role model for student interest.** Deliver your presentations with energy and enthusiasm. As a display of your motivation, your passion motivates your students. Make the course personal, showing why you are interested in the material.
- **Get to know your students.** You will be able to better tailor your instruction to the students' concerns and backgrounds, and your personal interest in them will inspire their personal loyalty to you. Display a strong interest in students' learning and a faith in their abilities.
- **Use examples freely.** Many students want to be shown why a concept or technique is useful before they want to study it further. Inform students about how your course prepares students for future opportunities.
- **Use a variety of student-active teaching activities.** These activities directly engage students in the material and give them opportunities to achieve a level of mastery.
 - Teach by discovery. Students find as satisfying as reasoning through a problem and discovering the underlying principle on their own.
 - Cooperative learning activities are particularly effective as they also provide positive social pressure.
- **Set realistic performance goals** and help students achieve them by encouraging them to set their own reasonable goals. Design assignments that are appropriately challenging in view of the experience and aptitude of the class.
- **Place appropriate emphasis on testing and grading.** Tests should be a means of showing what students have mastered, not what they have not. Avoid grading on the curve and give everyone the opportunity to achieve the highest standard and grades.
- **Be free with praise and constructive in criticism.** Negative comments should pertain to particular performances, not the performer. Offer nonjudgmental feedback on students' work, stress opportunities to improve, look for ways to stimulate advancement, and avoid dividing students into sheep and goats.
- **Give students as much control over their own education as possible.** Let students choose paper and project topics that interest them. Assess them in a variety of ways (tests, papers, projects, presentations, etc.) to give students more control over how they show their understanding to you. Give students options for how these assignments are weighted.

Sources:

- Ken Bain, *What the Best College Teachers Do*, Harvard University Press, 2004, pages 32-42.

- Linda Nilson, *Teaching At Its Best: A Research-Based Resource for College Instructors* , 2nd edition, Anker Publishing, 2003, pages 41-44.
- Matt DeLong and Dale Winter, *Learning to Teaching and Teaching to Learn Mathematics: Resources for Professional Development*, Mathematical Association of America, 2002, pages 159-168.

Showing Students the Appeal of the Subject

When encouraging students to find your subject matter interesting, use cues to show students the appeal of the subject matter.

<i>Appeal</i>	<i>Examples of Cues</i>
Novelty	“I think that is really neat—I haven’t seen anything quite the same.”
Utility	“This next topic is something that we’ll use again and again. It contains valuable ideas that we’ll use throughout the later sections of the course.”
Applicability	“As you work through the next section, I think that you’ll be pleasantly surprised how relevant it is.”
Anticipation	“As you read through, ask yourself what this section of work is hinting at as the next logical step.”
Surprise	“We’ve used X in a lot of different ways. If you thought you’d seen them all, just wait for the next assignment.”
Challenge	“Who’s up for a challenge? I think that you’ll find the next piece of work very interesting.”
Feedback	“When you try this, you’ll find out whether you really understood yesterday’s lesson.”
Closure	“A lot of you have asked me about X . Well, finally we’re going to find out why that’s so.”

Source: Matt DeLong and Dale Winter, *Learning to Teaching and Teaching to Learn Mathematics: Resources for Professional Development*, Mathematical Association of America, 2002, page 168.