Motivating Learning

Student motivation is probably the single most important element of learning. Learning is inherently hard work; it is pushing the brain to its limits, and thus can only happen with motivation. Highly motivated students will learn readily, and make any class fun to teach, while unmotivated students will learn very little and generally make teaching painful and frustrating. Fortunately, research shows that there is a lot an instructor can do to motivate their students to learn.

It is important to recognize that motivating learning is a central element of good teaching. Often, it is assumed that university students should be motivated to learn in every class, but that is not a reasonable expectation. Course requirements, assignments, and exams exist because students do not yet have the experience and wisdom to recognize which courses to take and what activities they need to complete in those courses to achieve appropriate educational goals. For the same reason, a student cannot be expected to come into every course motivated to learn the material. If a student does not know the material in a course, how can they know it is important and fulfilling to learn? The instructor, an expert in the subject, is uniquely qualified to show students why the material is important, intellectually interesting, and valuable for them to learn. Conveying this message is an important goal of any effective instructor.

What can an instructor do to motivate their students to learn? This is a subject that has been widely studied, and two excellent references are given below. While individuals vary, there are three elements that are consistently relevant to the motivation to learn: personal relevance, some control of the learning process, and a sense that one can master—and is mastering—the material.

Personal relevance & interest:

First, the material must be seen as personally relevant, interesting, and/or useful to the learner. The emphasis and challenge here is on "to the learner." That means recognizing the students' backgrounds and experiences and aspirations, and finding ways to connect the material to those. What you see as interesting may not be interesting for many of your students. In practice, making the material relevant usually means finding ways to present it in terms of authentic real world situations and problems that the students can relate to. Showing how the material will be used in careers that they aspire to is also motivational. Rather than first introducing a lot of formalism and jargon, and then at the end showing how it can be applied to solve some meaningful problem, do it the other way around. Present the problem first, and then introduce the formalism as the way to solve the problem. Make sure that your assignments do not leave students wondering, "Why would anyone (besides my teacher) *care* about the answer to this problem?"

The attitude you convey about the subject is also important. Tell the students why you find the subject interesting. While it is good to show that you are enthusiastic and excited about your subject, it is even better to find ways to convince your students that the subject is interesting. What a person finds interesting is shaped by their knowledge and past experiences. Don't assume that because you see the material as interesting, the students should as well (and if they don't, there is something wrong with them).

Choice and control:

A second almost universal motivating element is for the learner to feel they have some degree of control over the learning process. Relatively modest amounts of control or choice can make a large difference in motivation. Obviously, there are many elements of a course where you, as the expert, should be determining the choices. However, look for other areas where the students can decide. For example, allowing some choice over assignment topics or formats, and having projects where the student can choose a topic of particular interest to them.

Sense that one can master the material:

The third general motivating factor is providing the learner with a sense that they can master the subject, and that they understand the process to follow to achieve that mastery. These are best addressed by having suitable levels of challenge in the course and providing clear feedback as to how well students are meeting those challenges. Assignments that the students see as challenging, but they can then also see they successfully completed (and as a result now have capabilities and knowledge they previously did not have), are highly motivating. It is also important that the feedback and grades are aligned with the course goals. It is demotivating for a student to feel they worked hard and mastered the material in a course, only to do badly on an exam because it was highly dependent on knowing some solution trick that was quite peripheral to the course as a whole.

The feedback that best motivates learning is that which stresses the importance of effort and the specific processes and strategies for learning. Feedback and grading that focuses on what the student has mastered, and how they can improve, is more motivating to most students than feedback that focuses primarily on their standing relative to their peers.

Failure to adequately address student motivation has important consequences for students from groups under-represented in the field of study. If the instructor ignores motivation, the students who are most likely to see the subject as worth learning are those whose backgrounds, and corresponding attitudes, are most like that of the instructor. Those students whose backgrounds are different, which by definition (usually) includes most members of under-represented groups, will be less likely to understand the appeal of the subject and consequently more inclined to put their efforts into pursuing some other discipline.

Some suggested instructional strategies to improve student motivation:

Motivational factor	Instructional Strategies
Personal relevance & interest	• When possible, use authentic real world contexts and problems that the students can relate to • Show how material is useful in other courses and/or future careers • Before launching into definitions, procedures, mathematical formalism, etc., introduce a meaningful problem that motivates the need to learn these details and tools • Check that all your assignments pass the "why would anyone *care* about the answer to this problem?" test • Show your own interest and enthusiasm for the subject • If you are uncertain as to what the students will find interesting or relevant, ask some students (a good group to ask are students who recently took the course)
Choice and control	Build some flexibility into your course, within reason • If there are some optional topics in the course, have students vote on which ones to include • Let students choose the topic for a project or assignment • If there is more than one reasonable way to manage assignments, have students vote on which they prefer

Sense that one can master the material	• Communicate clear learning goals to the students
	• Express to the students that they can master the material if they put in effort
	• Create assignments and activities that are challenging, but doable with effort (a diagnostic or other assessments in the course can help determine the appropriate level of challenge)
	  − Build in early success (e.g. ramp up the difficulty in an activity, so that all students can relatively easily complete the first part)
	  − Build "bonus" challenges into activities to keep the faster students engaged
	• Regularly provide feedback that gives students a clear sense of how well they are mastering the material
	• Make sure the course elements and assessments are aligned with the learning goals
	• Explicitly point out to students how much they have learned
	• Give students specific advice on how they can improve their learning

References:

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