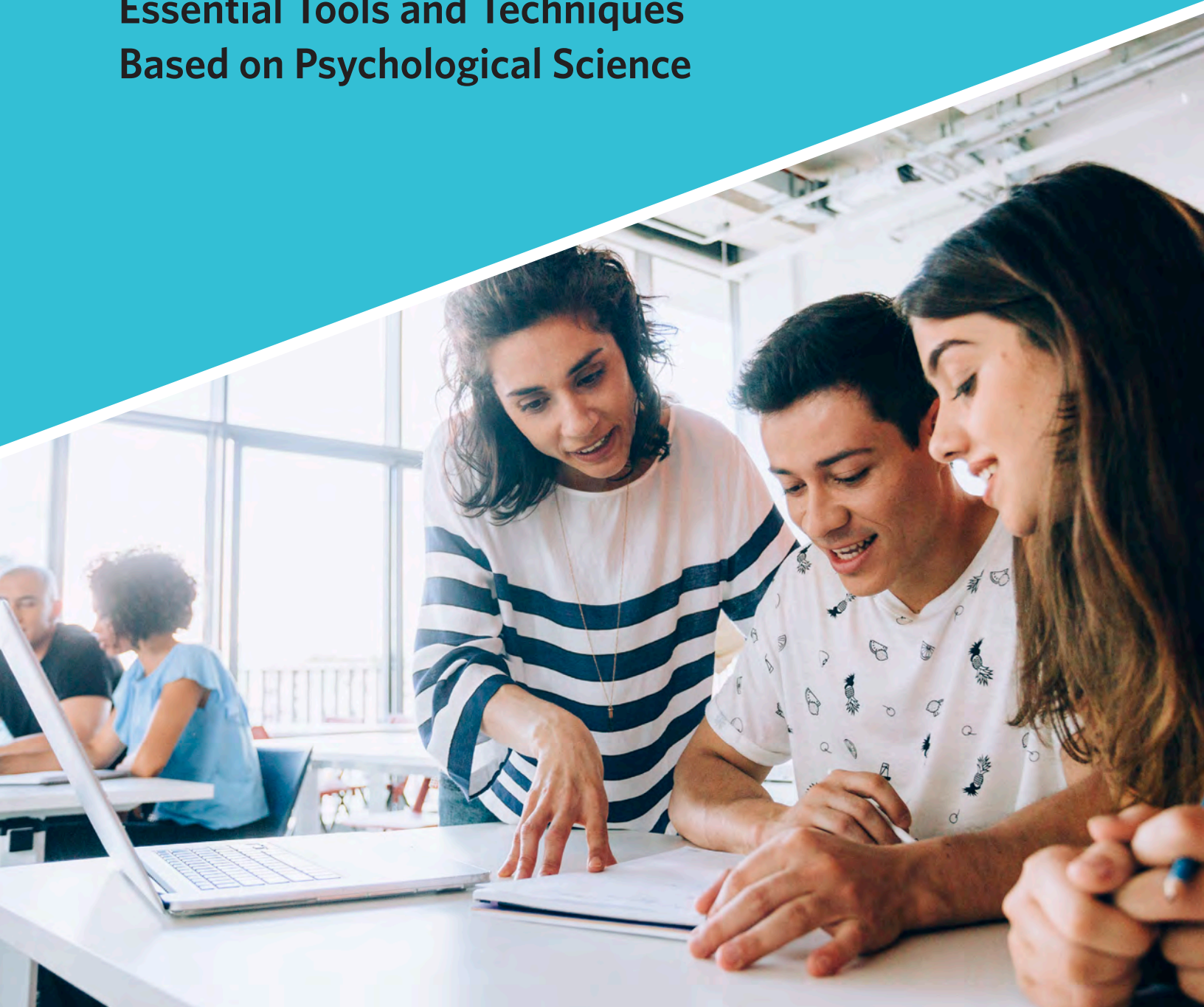




AMERICAN
PSYCHOLOGICAL
ASSOCIATION

The APA Guide to College Teaching

**Essential Tools and Techniques
Based on Psychological Science**



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The task force patterned our work on the framework developed in the *Top 20 Principles from Psychology for PreK-12 Teaching and Learning* (accessible at <http://www.apa.org/ed/schools/cpse/top-twenty-principles.pdf>) by the APA Coalition for Psychology in Schools and Education (2015). Accordingly, many of the concepts included within the *APA Guide for College Teaching and Learning* were derived from that original work. Through the *APA Guide to College Teaching and Learning*, we sought to extend these contributions by describing some of the major concepts that are particularly relevant to instructors in higher education.

The task force would like to thank CABE and APA for supporting our work. Specifically, we extend our sincere gratitude to Martha Boenau and Robin Hailstorks for their leadership and support, and Rhea Smith for her assistance with copy editing the final document.

The APA Guide to College Teaching

Essential Tools and Techniques Based on Psychological Science

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Introduction

Research from psychological science can tell us a great deal about how to enhance our teaching and learning in the classroom. Because translation of the science to education is so important, various groups have created reports indicating how the science can be used in a variety of classroom settings. For example, the Institute of Education Sciences created a practice guide explaining how cognitive science can be used to improve instruction and studying (Pashler et al., 2007). And, in 2015, the American Psychological Association (APA) Coalition for Psychology in Schools and Education published *Top 20 Principles from Psychology for PreK-12 Teaching and Learning* (accessible at <http://www.apa.org/ed/schools/cpse/top-twenty-principles.pdf>). The report identifies 20 important principles from psychological science that can be applied in the preK-12 classroom to improve teaching and learning, including issues related to student thinking and motivation, social context, and classroom management. These principles have implications for effective instruction, classroom environments that promote learning, social interactions between teacher and student, student motivation, and the use of assessment.

Psychological science has much to offer to improve teaching and learning in higher education as well. While many of the recommendations appearing in recommendation guides such as the IES practice guide and the APA Top 20 Principles for PreK-12 teaching guide translate to adult learners in higher education settings, a complete and practical compilation of the ways in which psychological science can be utilized to promote learning specifically in higher education, including issues related to the way students process information, social context, classroom management, and even food security and homelessness, does not yet exist. To provide the greatest assistance for people working in higher education, the Committee on Associate and Baccalaureate Education (CABE) created a task force to create such a guide. Here, we identify 21 ways that instructors can implement concepts from psychological science that would be of the greatest use to those in higher education settings.

The CABE task force is an ideal group to translate the research from psychological science to develop this guide. The group represents a diverse group of individuals who teach in a range of higher education settings from community colleges to university settings, and many conduct research in higher education settings. The group also comes from a diverse range of sub-disciplines within psychology, with deep roots in studying and working in such areas as cognition and the science of learning, impacts of diversity and intersectionality on teaching and learning, human development, service learning, and experiential learning.

APA is dedicated to providing support from psychological science to education at all levels. For more resources on education, visit www.apa.org/ed/schools/coalition/index.

METHODOLOGY

This report was inspired primarily by the *Top 20 Principles from Psychology for PreK-12 Teaching and Learning* report published by the APA Coalition for Psychology in Schools and Education in 2015. In developing this work, the members of the CABE task force began by reviewing the 20 principles from the preK-12 report. Their original 20 principles were derived by having members identify kernels from psychology that they felt could be applied to preK-12 education (Embry & Biglan, 2008), and then were clustered and synthesized into the 20 most important principles. We began by carefully examining their 20 principles. We then determined whether each concept presented was relevant or could be relevant for college teaching. We considered whether there was research to support the use of these concepts with adult learners in college contexts in addition to the literature cited within the preK-12 report. Relevant concepts were carried forward for this report and rewritten to better reflect teaching and learning in higher education. Next, we identified other concepts relevant to college teaching and learning.

At this stage, we had identified 21 concepts that were highly important for college teaching and learning. The task force then created recommendations for instructors teaching in higher education, with one concept presented in each chapter. Each chapter begins with a bulleted list of ways that instructors can use the concept to promote learning and student success in their classrooms. Then, for each concept, we explain why this concept is important and some of the psychological science research backing each concept.

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How Our Students Think and Learn

- What our students believe affects how they think and learn.
- Our students' prior knowledge affects their learning.
- Retrieval practice helps our students learn.
- Choose appropriate tools for learning; newer is not always better.
- Transfer of learning to new situations, problems, and contexts is not spontaneous, but instead needs to be practiced.
- Knowledge and skill acquisition depend largely on deliberate practice.
- You can enhance students' learning by giving timely feedback that transforms evaluations into learning opportunities.
- Self-regulatory skills can be learned! And they contribute to further learning.
- We can encourage student creativity.

Motivating Our Students

- Motivating our students intrinsically is more effective than trying to motivate them extrinsically.
- Helping our students adopt mastery goals will make them more persistent and encourage deeper information processing than if they have performance goals.
- What we believe about our students and expect from them affects their learning opportunities, motivation, and learning outcomes.
- Our students should set both near-term and far-future goals

The Importance of Social Context, Interpersonal Relationships, and Emotional and Physical Well-Being

- Learning is situated within multiple social contexts.
- Interpersonal interactions in the classroom can foster learning.
- Students' performance, learning, and development are influenced by their emotional well-being.
- Students suffering from homelessness, food insecurity, and poverty require special support.

Managing Our Classrooms

- We must teach new students to adhere to basic standards of classroom behavior using direct instruction and the principles of behavioral learning.
- Classroom management is a form of mentoring.

Assessing Students' Progress

- We should use both formative and summative evaluation appropriately.
- We must be careful to use fair, high-quality assessments to measure students' skills, knowledge, and abilities.

How Our Students Think and Learn



What Our Students Believe Affects How They Think and Learn.

Mindsets matter. What students believe about intelligence can influence their academic success and resilience. But research demonstrates that it's not only possible to foster a growth mindset among students, it's important to teach growth mindset alongside proper study skills to help them succeed. When we convey to our students that their poor performance is a result of factors under their control, such as lack of effort or poor strategy, we empower them to improve their future performance.

Help foster your students' beliefs that they can enhance their intelligence by applying the following strategies:

- Help students understand that failing at a task does not mean a lack of ability, and that learning any given skill takes time and effort. Immediate mastery of a task does not equal durable, long-term learning.
- While effort is important, you should emphasize to your students that they must combine their efforts with the right strategies to achieve success in any given task. When students fail at a task, find out how they approached the task and guide them through the use of more effective strategies for future success.
- Avoid attributing students' success to natural ability, such as praising a student by saying "You're so smart," especially when the task is moderately easy. Instead, praise students for their effort or for their successful use of strategies.
- Develop assignments that provide opportunities for students to build on their skills.
- Encourage a growth mindset among students by explicitly teaching them that during durable learning, the brain is developing new connections among neurons, and that research has shown that this results in better academic performance in the long-term.

WANT TO LEARN MORE?

Some people believe that we're born with the intelligence that we have, that it's a fixed trait. Students who adhere to this "fixed" or "entity" theory of intelligence tend to worry about hiding any evidence that their skills are lacking. They prefer to take on easy rather than challenging tasks in order to avoid failure, and when they do fail, they tend to attribute it to a lack of ability and give up on the task. This, in turn, undermines their immediate motivation and short- and long-term performance.

On the other hand, some people believe that we can improve our levels of intelligence through effort. Students who adopt this "incremental" or "growth" mindset enjoy taking on challenging tasks in order to boost their intelligence or ability. When they fail, they tend to attribute the failure to factors that they can control, such as insufficient effort or choosing a bad strategy. Because of this, they bounce back quickly after failure and are motivated to keep trying.

As a result, these students tend to do better on various cognitive and problem-solving tasks.

Your own mindset also matters. Instructors who believe that intelligence is fixed may be more prone to tell students who struggle in a particular subject area that it isn't their "strength," or may praise high-performing students as "smart." Unfortunately, these messages promote the belief that intellectual ability is fixed, unchangeable, and uncontrollable. Ironically, this belief can undermine students' resilience after failure. On the other hand, instructors who have a growth mindset praise students for taking on challenging tasks or for trying different strategies to succeed on a task. This type of feedback suggests to students that seeking out challenge is a great way to learn and that struggling is a normal part of the learning process. Often the most effective ways to learn involve difficulty, and this difficulty should be embraced rather than avoided. When learning feels very easy, it is often a sign that learning is not durable and will be rapidly forgotten.

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Our Students' Prior Knowledge Affects Their Learning.

Students arrive to college with a variety of beliefs, knowledge and skills gained from their previous academic and life experiences, and cultural backdrops. These previous experiences and background knowledge influence how they organize and interpret new information, what and how they learn.

Here are some ways you can leverage prior knowledge in your classroom:

- Use baseline assessments to gauge students' current knowledge. Use a formative pre-test at the beginning of a course, unit or lesson, or more informal assessments such as questioning and brainstorming at the beginning of a new topic.
- Help students activate prior knowledge by asking them questions that trigger recall, using prompts and reminders, or by incorporating activities that help them connect what they already know to the new content.
- Help students become aware when prior knowledge is (or is not) applicable by:
 - Explicitly teaching the conditions and contexts in which knowledge is applicable;
 - Using analogies to help students relate new content to previous knowledge and experiences while making them aware of the limitations of these analogies; and
 - Using concrete examples to illustrate abstract concepts.
- Use a variety of strategies to encourage change in students' misconceptions. For example, instructors can use:
 - Bridging, a "gradual process of reasoning that helps [students] build on accurate facets of their knowledge as they gradually revise the inaccurate facets";
 - Activities that promote cognitive conflict or dissonance;
 - Presentations to students with actual data that challenge students' misconceptions; or
 - Student data collection on topics that will challenge their existing misconceptions.

WANT TO LEARN MORE?

Although students' prior knowledge is fundamental for the acquisition of new and more complex knowledge and its retention in memory, its role in learning is paradoxical. When prior knowledge is appropriate, consistent, and accurate, it aids learning. This knowledge facilitates learning by acting as "mental hooks" where new information anchors. Other times, students' prior knowledge might be insufficient, inappropriate, or inaccurate. In these instances, prior knowledge can thwart the acquisition of new knowledge or even distort it. Misinformation and misconceptions can interfere with new knowledge acquisition. Misconceptions, "models and



theories that are deeply embedded in students' thinking" are highly resistant to change (e.g., stereotypes about groups), and thus harder to address. Changing students' misconceptions requires time, repeated exposure and ingenuity, and as such requires intentional, careful planning and numerous experiences that lead to the accommodation of previous schemas.

You can significantly increase students' opportunities for learning. Dedicate instructional time to assess students' background knowledge; activate their prior knowledge and experiences to help them make connections with new knowledge and skills and to help them retain new information; and plan activities and experiences to address knowledge gaps and misconceptions that might conflict with the course goals and content to prevent detracting from learning.

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Retrieval Practice Helps our Students Learn.

Retrieval practice, or bringing information to mind from memory, can be extremely beneficial for student learning. Retrieval practice helps students become more flexible with the material so that they can apply it in new situations, and retrieval practice produces learning in the long-term.

Here are some ways that you can use retrieval practice in your courses to help improve student learning:

- Give students frequent tests or quizzes in the classroom to improve learning.
- Design quiz questions that require the students to apply what they know in new situations or show they understand a concept more deeply, in addition to questions that ask about facts.
- Space multiple retrieval opportunities out over time for even more benefit.
- Use technology to help provide quizzes. Most class management systems can administer quizzes that students can complete on their own at home. There are also many free quiz apps that you can use in the classroom (though see the chapter about technology).
- You don't always have to grade every question that your students answer. Your objective is to create opportunities for students to retrieve the information. If you're using a format that is harder to score (e.g., short-answer questions), you can have students self-score the answers, or even have them switch with a partner.
- Use activities that encourage retrieval, such as drawing, creating concept maps, or explaining ideas to peers. These activities will require retrieval practice, but in a non-traditional test environment.

WANT TO LEARN MORE?

Historically, people have thought of tests and quizzes as ways to assess learning. Certainly, they can be used for assessment, and later in this document we discuss the importance of assessment. However, a great deal of research shows that students actually learn from the process of taking the test or quiz. When students answer questions on a quiz or a test, they are practicing retrieval, or bringing information to mind. Retrieval practice has been shown to improve learning. When students retrieve information, they are better able to remember the information later on. Retrieval practice helps students learn facts, but it also helps students learn conceptual information, and improves their ability to apply the information in new situations. There's even some evidence that open-book quizzes can help students learn too! However, students should work their way up to being able to retrieve the answers on their own. Students will get an even larger learning benefit when they practice retrieval repeatedly, and space repetitions out over time.

Practicing retrieval can also help students indirectly. Answering questions can help students learn what they know and don't know, which might allow them to allocate their study time more efficiently.

Students are often overconfident in what they know and don't know, but retrieval practice reduces some of their overconfidence, highlighting what they need to study more. Providing frequent opportunities for retrieval practice can also motivate students to attend class. When students know that there will be frequent quizzes in a class, they are often more likely to come to class, and thus will at least be exposed to the material more than students who don't come to class. Finally, providing students with frequent questions can give the instructor feedback about how well they are teaching certain concepts. If a vast majority of students don't understand a given idea, instructors can use this information to inform their future teaching, and how they might reteach the idea to that class.

There are a number of ways that instructors can encourage students to practice retrieval in their classes. The most obvious is the use of frequent quizzes using short-answer or multiple-choice questions. Research has shown that both types of questions benefit student learning. Multiple-choice questions can be just as beneficial as short-answer questions, so long as the questions help the students to bring the appropriate information to mind.

However, retrieval-based learning activities don't necessarily need to involve a test or quiz. Recall that they actually just need to require students to retrieve, or to bring the information to mind. Other ways to encourage students to practice retrieval include asking students to create concept maps from memory. A concept map is a graphic organization of ideas, much like a flowchart (see this website: bit.ly/concept-maps-resource). To create a concept map, students put concepts in circles and then connect appropriately related concepts with links describing the relationships among them. Instructors can also ask students to draw what they know in other formats (for example, see this website for ideas: bit.ly/vee-diagrams-resource), or even explain ideas to one another.



A great deal of research shows that students actually learn from the process of taking the test or quiz.

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Choose Appropriate Tools for Learning; Newer is not Always Better.

The way we teach and learn is constantly evolving. Instructors are often suspicious of the newest techniques appearing in our tool-boxes. But even lecturing was once a new technology. Instructors have been suspicious of all sorts of new tools, such as the overhead projector or the slide rule. Current and emerging technologies, such as e-books, classroom response systems (such as clickers or students' own smartphones), laptop computers, and tablets continue to be present in our classrooms. And still others, such as lecture capture systems, online adaptive systems, learning management systems, cloud-based applications such as Dropbox or Evernote, social media, and virtual environments such as Second Life might be used in conjunction with our classes, or might even one day replace them. It's difficult to determine the best approaches to use with these technologies, let alone whether the technologies themselves are of any real value for our students.

Here are the top things to keep in mind when thinking about new educational technologies:

- Think critically. Is there any credible evidence with regard to their effectiveness?
- Does the technology align with your course objectives, teaching style, and particular subject matter?
- How will the technology help you to become more effective as an instructor?
- What are the possible trade-offs you might have to make if you choose to implement a new technology?
- Do you have the requisite knowledge and skills required to make the most of this new technology?
- Do your students have the requisite knowledge and skills required to make the most of this new technology?

WANT TO LEARN MORE?

The evidence on classroom use of technology is mixed, at best. For example, studies have shown that lecture capture systems may or may not be helpful to students. Importantly, their success depends a great deal on the types of students who will be using the lecture videos.

Technology should be used to aid effective strategies, when appropriate, but is not always necessary. For example, while we know from research in cognitive psychology that frequent quizzing is helpful for learning (see the chapter on retrieval practice), it's difficult to evaluate the actual educational value some of the sophisticated adaptive testing software and course management systems being marketed heavily by educational publishers. Current research shows that these systems may or may not be effective in advancing students' learning above and beyond instructors implementing their own quizzes in the classroom, or they may have marginal effects, again depending on students' use of the systems or



the systems' alignment with course objectives.

Also, as many authors have noted, some forms of technology may distract students from learning. This seems related to researchers' mixed results with regard to the use of computers, tablets, smart phones, or other delivery methods as opposed to paper textbooks for the delivery of information. Some studies have shown that the use of computers for taking notes tends to depress higher-level learning, although not necessarily surface-level learning. However, others have shown that when students use their computers or smartphones in appropriate or directed ways, they tend to learn better.

Some technologies have evidenced great promise when used appropriately. For example, studies have shown that students in various disciplines (especially in foreign language learning) can learn well when immersed in environments such as Second Life, and encouraged to interact and work collaboratively with other students. But even here, there are drawbacks and problems with regard to students becoming immersed in their roles, having difficulty understanding the parameters of the exercise, and not having enough background to be able to engage in the necessary processes.

Researchers have found that in order to make the most of the new technologies, students need a particular set of skills and attributes. Of these, the most important seem to be self-direction, self-efficacy, self-control, students' depth of approach to learning, and some degree of digital literacy.



Studies have shown that students in various disciplines (especially in foreign language learning) can learn well when immersed in environments such as Second Life, and encouraged to interact and work collaboratively with other students.

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Transfer of Learning to New Situations, Problems, and Contexts is not Spontaneous, but Instead Needs to be Practiced.

“Transfer” is the holy grail of education. We want students to be able to use the knowledge they acquire in class in novel situations. But learning happens within the context of a specific subject, scenario, or setting. For example, you could learn about gravity as a child sitting on a parent’s lap reading a book, or you could learn about it from a video, or in a classroom doing an exercise from a textbook. Scaffold students’ use of knowledge from contexts that are highly similar to the original learning context, and eventually to new, dissimilar and unfamiliar contexts.

Here are some ways to encourage transfer:

- Teach topics or concepts in multiple contexts.
- Give students many opportunities to practice transferring information learned in one context to another.
- Draw students’ attention to the features that make different contexts relevant to each other and thus appropriate for transfer.
- Help students identify contextual differences that make transferring from one situation to another less helpful.
- Provide many different concrete examples and counter-examples of studied concepts.
- Ask students to make up their own examples that illustrate concepts they are learning about.
- Help students distinguish between irrelevant surface features and deep underlying features of concepts.
- Encourage students to notice how the knowledge they are acquiring applies to the real world, both by providing real-life examples and by encouraging students to generate their own.
- Allow students to demonstrate applying what they’ve learned in a range of situations.

WANT TO LEARN MORE?

For transfer to occur, three conditions must be met: (1) students must realize that the situation requires them to use certain prior knowledge, (2) students must remember that prior knowledge, and (3) students need to successfully apply that prior knowledge to the new situation. Rather than expecting students to automatically transfer something they have learned, instructors should give students ample opportunity to practice applying knowledge to novel and varied situations.

Not all transfer is the same. Some contexts are very similar to one another, while others are quite different. Thus, it is important to distinguish between near transfer and far transfer. Near transfer refers to situations that are very similar to the original learning



situation; for example, performing the same set of mathematical operations on a different set of numbers. Far transfer might involve students realizing that the equations they learned in class would apply to solving a novel, and seemingly unrelated problem at work.

While we often talk about “teaching for transfer”, what we should actually do is teach transfer itself. Transfer doesn’t occur spontaneously. In fact, transfer can also be negative, when skills or information learned in one situation are misapplied to a context where they are not relevant or accurate. As such, negative transfer can actually prevent appropriate learning. Giving students practice transferring to many new contexts or situations that they may experience later can help students learn to transfer and make it more likely that they will realize that they can transfer something they have learned when they need to.

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Knowledge and Skill Acquisition Depend Largely on Deliberate Practice.

Design deliberate practice activities that account for students' current abilities, and encourage students to improve beyond where they are. Because by definition, non-experts aren't knowledgeable enough in the target domain, you'll need to scaffold these deliberate practice activities.

Here are ways to use deliberate practice in your classroom:

- Remind your students that deliberate practice can be hard, but that this difficulty helps their learning (see the chapter on how what our students believe affects their learning).
- Emphasize that “deliberate practice” isn't just another way of saying “practice makes perfect.” Merely practicing a lot and putting in a lot of effort are not enough.
- Remind your students that their practice needs to be designed specifically to develop target skills (see the chapter on transfer of learning).
- Ensure that students' practice is spaced over time and not simply massed until mastery.
- Provide feedback to help scaffold deliberate practice activities (see the chapter on timely feedback).

WANT TO LEARN MORE?

We can learn a lot about skill acquisition from the domain of expertise. The main cognitive difference between experts and novices in a particular domain appears to be their mental representations—that is, how they process and store information related to their domain of expertise. For example, expert chess players are able to recognize and remember chess positions and sequences of moves much more efficiently than novice chess players.

Mental representations are shaped through what is known as “deliberate practice.” In order for deliberate practice to be applicable to a skill, two conditions should be met: the skill should be one in which there is a relatively established benchmark for what counts as expertise, and there must be an instructor who can carefully guide and scaffold the process for the learner. It's important to distinguish between *deliberate* practice and repetitive practice. Repeating a task without deliberately involving attention and spacing out the repetitions may not do much to reinforce learning. To acquire new knowledge and become proficient in basic skills (and, eventually, more complex skills), one must rehearse strategically. This is where the instructor becomes invaluable in helping students distinguish between effective and ineffective practice.

As expertise in a given domain increases, mental representations might evolve from simple storage of unrelated facts to a meaningful and coherent framework. This type of sophisticated mental representation can help the learner determine when they are making errors, and in what deliberate practice they need to engage to correct them.

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You Can Enhance Students' Learning by Giving Timely Feedback that Transforms Evaluations into Learning Opportunities.

Our role as instructors is to facilitate students' learning, and assessment is an integral component of that facilitation (see the last section of this booklet). Evaluations that provide feedback that informs students about how they are doing and how they can improve can increase their motivation, their learning, and their engagement with the material, and create a more comprehensive learning opportunity. According to some research, formative feedback can transform students' work in ways that help the students to further their own learning. Appropriate formative feedback also can promote and enhance self-regulation.

You can use assessment to create learning opportunities by implementing some principles of good feedback practices:

- Discuss the goals of the course, unit, or assignment with the students, and provide examples of what good and poor responses or performances look like.
- Provide rubrics that provide evaluative criteria at different levels of achievement (though see the chapter on setting goals regarding rubrics).
- Facilitate the development of self-assessment and reflection in learning (e.g., by using rubrics for students' self-evaluation and self-reflection, and for peer review).
- Provide good, meaningful feedback that informs students about how well they are doing and how they can improve.
- Discuss with students the process they used to reach a determined answer rather than just focusing on whether the student "got the right answer."
- Allow students to use your feedback to modify their work or responses to a test (e.g., use an iterative process of work resubmission for written assignments, so that students receive feedback that helps them construct better work, or allow students to work on wrong multiple-choice items by resubmitting them with explanatory answers for some additional points).
- Provide timely feedback. Consider whether to give immediate feedback to help reduce faulty conclusions or misunderstanding, or allow more time to encourage self-reflection and self-correction. Remember that timely feedback helps reduce student stress and can enhance their engagement with the course. (i.e., students who have to wait for a long time for feedback tend to feel more negatively about the assignment and, by extension, the course).

WANT TO LEARN MORE?

Feedback works best when it is timely, targeted, and specific. Immediate feedback works best when students are learning new and complex concepts or procedural skills, as it helps reduce the risk of learning misconceptions or faulty procedural skills by allowing students to correct erroneous responses. Other times, when students are expanding their knowledge or applying it, purposefully delaying feedback allows some time for students to self-correct which can increase self-regulation, persistence, and self-confidence. In addition, meaningful feedback works best when it addresses the gap between students' current levels of performance and the targeted learning goals and expectations of the learning situation. Finally, feedback works best when it is specific. Generic evaluative labels, or grades that simply represent "how well" students performed don't tell students what they did wrong or what they need to do to improve; plus, they promote a performance rather than a learning orientation (see the chapter on helping our students adopt mastery goals).

Timely, meaningful feedback can also help students further develop introspective consideration of their own thought processes (metacognition), self-regulation, and critical thinking. Researchers have argued that formative feedback in higher education should focus on empowering students as self-regulated learners. It is also important to note that while it is certainly necessary to highlight deficits in a student's work, the way in which those deficits are framed can transform an evaluation into a constructive opportunity for growth and improvement. However, when students feel that their work has been comprehensively derogated by an instructor, it can reduce motivation and disrupt engagement.

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Timely, meaningful feedback can also help students further develop introspective consideration of their own thought processes (metacognition), self-regulation, and critical thinking.

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Self-Regulatory Skills can be Learned! And They Contribute to Further Learning.

Self-regulation, or guiding one's own learning process, is an important skill for students in higher education to master. More so than in primary and secondary education, college and university students need to be able to manage more flexible schedules and determine how much time to spend reading, studying, and working on assignments outside of class; engaging in independent study; and seeking out help when they need it.

Here's how you can use a variety of strategies to help your students learn self-regulatory skills and greatly facilitate learning:

- Model self-regulatory skills by:
 - Thinking out loud to demonstrate thinking and problem-solving skills in their domains or to demonstrate the steps needed to solve a specific task;
 - Showing different ways to organize information for meaningful learning (e.g. concept maps, V-diagrams); and
 - Taking time to show students how they approach readings and what they consider important.
- Teach and provide opportunities to practice:
 - Specific strategies for learning and thinking about course content;
 - Different strategies to help organize course content in meaningful ways (e.g. concept maps or other graphic organizers); and
 - Teach effective independent learning strategies, and allow students to practice and reflect upon their effectiveness and their difficulty.
- Support students' self-regulated learning efforts by helping students:
 - Set meaningful goals for your classes and provide them with opportunities to reflect on how the course material can be useful to them;
 - Recognize and self-assess the short- and long-term implications of the decisions they make;
 - Reflect on their approaches to mastering a learning task (e.g. exam preparation, use of strategies and performance) and to consider ways to better approach next learning challenges; and
 - Recognize desirable difficulties that improve durable learning, rather than produce immediate mastery that will soon be forgotten.



- Organize the classroom environment to enhance self-regulation by:
 - Clearly stating lesson goals and tasks;
 - Breaking up lectures with questions that promote thinking and reflecting on the material;
 - Providing processing time and practice (such as summarizing, questioning, retrieval practice, etc.) for long-term remembering;
 - Introducing new material by tapping into students' previous knowledge (such as linking new material to material learned in previous courses or using analogies and multiple concrete examples);
 - Assigning reading reflections to help students with self-monitoring and reflective thinking, and to encourage retrieval practice; and
 - Clearly spelling out the criteria for successful task performance.

For more information see Svinicki and McKeachie (2014). They dedicate an entire chapter to strategies on how to teach learners to become more strategic and self-regulated learners.



Instructors can help students develop self-regulation skills through direct instruction, modeling, support and by providing classroom organization and structure.

WANT TO LEARN MORE?

Zimmerman (2002) defines self-regulation as the “self-directive process by which learners transform their mental abilities into academic skills” (p. 65). Self-regulated learners actively set task-related, doable goals; deliberately select and use cognitive and motivational strategies to achieve those goals; monitor their strategy use; and modify their strategies when needed, based on task demands. Instructors can help students develop self-regulation skills through direct instruction, modeling, support and by providing classroom organization and structure.

One aspect of self-regulation is making decisions about what to do while guiding one's own independent learning. It should be noted that students' intuitions about what helps them learn are often inaccurate. For example, repeated reading is a common strategy reported by students during independent learning; often students are overconfident in the amount they are learning while repeatedly reading their course materials. On the other hand, few students report engaging in retrieval practice (for example, self-quizzing), an effective study strategy that often makes learning feel slower. (For more on this, see the chapter on retrieval practice) Effective learning strategies are often difficult, and students need to be taught that these difficulties are desirable.

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We Can Encourage Student Creativity.

“The formulation of a problem is often more essential than its solution, which may be merely a matter of mathematical or experimental skill. To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science.” – Albert Einstein.

In addition to learning content, students need to learn to think critically and creatively. Here are some ways you can encourage creative thinking in your courses:

- Remain open to creative responses from students to increase creative thinking. Bear in mind that environmental factors can affect students’ creativity. These may include the general atmosphere of the class, the time permitted for creative thinking, the kinds of materials available, and even the design and layout of the classroom, among many other things.
- Encourage creative thinking by using learning activities that help students practice visualizing problems. There is a link between visualization and creativity, where those who are better able to visualize are problem are more likely to come up with creative solutions.
- Encourage diverse perspectives in the classroom. Research shows prolonged interactions with diverse ways of thinking (e.g., interactions with people from multiple countries or backgrounds) improve creativity.
- Don’t expect creativity to be omnipresent. Creative ideas take deliberate thinking. In fact, often times taking a break from a problem or task can help students move away from “dead-end” solutions and come up with creative solutions to a problem. Be sure your students understand this point, as well.
- Foster intrinsic motivation in the classroom. Creativity is more likely to occur when students are intrinsically motivated to complete a task (see the chapter on intrinsic motivation). Helping students to find areas of study that they love and classes that they enjoy should increase creative thinking.
- Provide low-stakes assignments to foster students’ creativity. Concentration on extrinsic reward structures, such as grades, token economies, or financial gain, can undermine intrinsic motivation. Time limits or knowing one’s work will be judged can undermine intrinsic motivation, so low-stakes or even no-stakes assignments can be helpful.
- Don’t lose your focus on transmitting knowledge as well as encouraging students to question what they are learning. Students still need to have a sound knowledge base to creatively apply what they know in new situations.

WANT TO LEARN MORE?

In our 21st century world there are constant changes in technology and science. Further, as we continue to become more and more specialized in our areas of expertise, the need for interdisciplinary



work increases. Thus, our students need to be creative to continue propelling society forward. Creative ideas are those that are both novel and appropriate in the context. In many ways, creative thinking overlaps with critical thinking, which involves conceptualizing, applying, analyzing, or evaluating information with an unlimited number of solutions. Creativity plays a central role in today’s organizations, and creative thinking is linked to improved student performance at the college level. Importantly, instructors can enhance creativity in their higher education classrooms.

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Motivating Our Students



Motivating Our Students Intrinsically is More Effective Than Trying to Motivate Them Extrinsically.

Motivation is the drive or energy that moves people to engage and persist in certain behaviors. Conceptually speaking, there are two types of motivation: intrinsic and extrinsic. In academic settings, intrinsic motivation refers to goal-directed actions students engage in because these tasks are inherently interesting and enjoyable. Extrinsic motivation, on the other hand, refers to students' actions that are driven by obtaining an external reward (e.g. grades or praise) or to avoid punishment. When students are intrinsically motivated, they tend to experience better outcomes.

You can encourage intrinsic motivation in your students by incorporating of practices and activities that support their fundamental needs for *competence*, *autonomy*, and *relatedness*:

- Monitor the messages you send to students about their grades and GPA. Instructors who connect grades and GPA to students' future success (e.g., "You need to maintain a 3.5 GPA in order to pass this class", "You won't become a teacher if you don't get your grades up") may decrease intrinsic motivation and activate threat anxiety. Instructors who connect grades and GPA to the benefits for students' learning and mastery (e.g., "Doing well in this course means that you've learned what it takes to be a great teacher", "Students who master the teaching skills in this course will get high grades") can bolster students' intrinsic motivation and recognize the extrinsic benefits of success in a way that preserves students' autonomy and control.
- Involve your students in course decision making to enhance their empowerment, engagement, and intrinsic motivation. Try integrating student feedback into the learning goals of the course by asking them what "big questions" they have for the course and what problems they want to solve. For example, in his "Blank Syllabus" approach, Walsh assigns students the task of selecting course readings from an anthology. Faculty across disciplines have reported positive outcomes from collaborative syllabi created through an interactional dialogue between faculty and students.
- You can also promote student autonomy by offering a variety of assignments (beyond exams) so that your students can select assessments that match their strengths and learning competencies. The high-impact educational practices designated by the Association of American Colleges and Universities (AAC&U) offer a menu of options that reflect higher-order learning skills that have additional benefits of promoting creativity (see the chapter on creativity) and reducing cheating behaviors. Examples of these practices include service/community-based learning, writing-based assignments, internships, global learning/study away, and collaborative learning projects.

- Praising students and providing positive feedback, although regarded as extrinsic motivation, can bolster intrinsic motivation when you offer them specifically and sincerely. Disingenuously praising students for performance (i.e., leading students to believe their performance was better than it actually was) or for their effort (e.g., commending students for working hard when they really didn't) backfires. Students engage in more goal-directed behavior when instructors convey that they have high standards, that their feedback will help students meet those standards, and that they believe students can meet those standards.

WANT TO LEARN MORE?

Overall, the most effective college instructors are not those that wield their intellect and power over their students, but develop a sense of competency and agency *within* their students. Instructors who convey openness in their relationships with students and classroom atmosphere will naturally promote intrinsic motivation, self-confidence, and a genuine passion for learning (see the chapter on self-regulation). Psychologically-based needs for autonomy (feelings of control and independence), competence (e.g. mastering knowledge or skills,) and/or relatedness (sense of belonging) drive students' intrinsically motivated actions. Students' efforts are frequently driven by a combination of both internal and external motives. Students might engage in academic tasks because they enjoy the activity or subject matter but also because they want to get a good grade and be praised by others. However, intrinsic, not extrinsic, motivation often correlates with students' learning efforts and success; the benefits of intrinsically motivated task engagement seem to extend far beyond task enjoyment. Intrinsic motivation is associated with less anxiety and more enduring learning, achievement, and perceived competence.

These learning benefits might result from the way intrinsically motivated students approach learning tasks. For example, these students might attend more closely to instruction, organize information more effectively, or associate new information to what they already know. Moreover, students' self-reports show a positive association between high intrinsic motivation and high levels of self-efficacy and a negative relationship with lower levels of achievement anxiety. By contrast, students who are driven mainly by external rewards, such as getting a good grade, seem to mainly focus their attention on such rewards rather than on mastering the material. Since the reward is the main goal, these students may take shortcuts, such as skimming the reading, taking the easier path where the stakes are not too high or even



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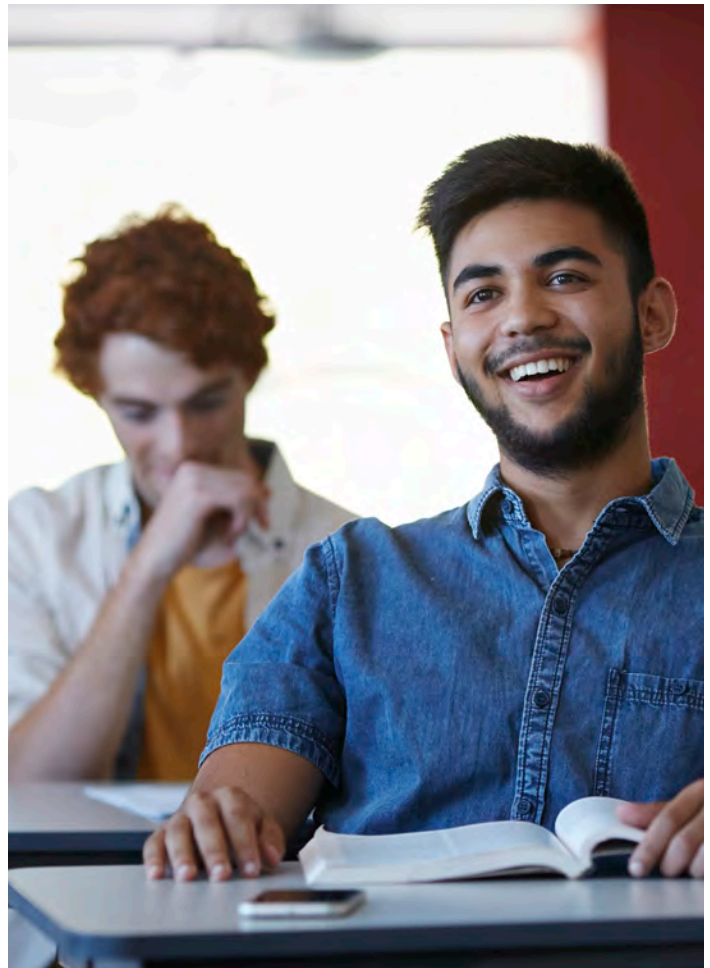
cheating. They may even disengage from the learning task once the external rewards are no longer available or not engage at all if rewards (e.g. extra credit) are not offered or are deemed insufficient. In contrast, intrinsically motivated students may dig deeper even if no rewards are offered because mastery is the reward.

In addition to students' individual differences (or learner characteristics), how college instructors structure their classroom environment has impacts on their students' motivation. Some research shows that students who feel a lack of agency and control within their learning environment may be extrinsically driven to perform (for example, to achieve good grades or meet parental expectations) which can inadvertently undermine their autonomy and learning (see the chapter on self-regulation) and promote cheating behaviors in college. Further, instructors who emphasize ability after students have performed a task well (e.g., "you must be very smart") rather than effort (e.g., "you must have worked really hard") can undermine student motivation (See the chapter on students' beliefs about intelligence and ability).

The relationship between intrinsic and extrinsic motivation is complex because intrinsic motivation alone may not be sufficient to promote successful learning. The challenge for college instructors is how to find the appropriate balance between the two types of motivation. Too many external rewards can erode students' drive to learn for mastery. Instructors should invoke extrinsic motivation judiciously in ways that: (a) link the benefits of performance with students' learning and mastery of key skills and knowledge, (b) reward students on the *quality* of their outcomes (not just participation or completion), and (c) remind students of their overarching goals.

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Helping Our Students Adopt Mastery Goals Will Make Them More Persistent and Encourage Deeper Information Processing Than If They Have Performance Goals.

Students bring different goals to the learning context influencing their motivation, engagement, and achievement. Researchers have identified two broad types of goals related to achievement situations: mastery (also called learning or task) goals and performance (also called ego-involved, outcome or ability) goals. Students with mastery goals focus on understanding and growth, the development of new skills and competence. In contrast, students with performance-oriented goals focus on outcomes as a way to validate their abilities, particularly when they perceive their own abilities as low.

You can organize the learning environment in different ways to promote a mastery-approach to goals and help performance-oriented students develop more adaptive achievement strategies:

- Emphasize learning, improvement, and competency rather than focusing on grades, comparison or competition when evaluating student work.
- Provide timely and private feedback that allows students to see their mistakes while at the same time discussing ways to improve. Even better, provide opportunities for them to correct their mistakes.
- Reassure students that mistakes and errors are opportunities to learn and clarify misconceptions rather than reflections of their ability.
- Decrease sharing information and compliments that focus on students' relative ability (e.g. you are so smart; your essay is perfect). Instead, specify what aspects of the work were exceptional and why, so that the student can be replicate them in the future.
- Praise the process, not just the outcome. Even when students don't arrive at a solution, it's important for students to recognize that they took incremental steps to reach the eventual solution. Praising the process emphasizes mastery over performance.
- Your criteria for success should emphasize a comparison of a student's previous performance to their current performance rather than social comparisons. For example, grade on the basis of meeting defined standards rather than on a curve (which bases individual performance on the basis of other students' performance). This will also reduce competition.
- Help students interpret constructive criticism as coaching (that is, as ways to improve their work) rather than evaluation (which would be a referendum on their innate ability). All criticism involves some element of evaluation, but if you explicitly reinforce the notion that evaluation reflects a snapshot of the present time, not of your students' potentials, you can orient your students towards mastery.

- When possible, provide students with some choice and control over assignments and assessments. This will increase their sense of autonomy and motivation.
- Create learning communities or collaborative learning environments because they can promote cooperation and teamwork while minimizing competition and social referencing. These high-impact educational practices promote team-based approaches to problem-solving and interpersonal communication which enable real-life skills for career preparation.
- Be sure to foster intrinsic motivation. Given the strong relationship between intrinsic motivation and mastery goals, such an orientation could also encourage mastery-approach orientations. For example, instructors who promote student autonomy, self-efficacy, and confidence can bolster students' mastery goal orientation as well as intrinsic motivation (see the chapter on fostering intrinsic motivation).

WANT TO LEARN MORE?

Mastery oriented goals facilitate persistence, even when tasks are challenging, and mastery-oriented behaviors that lead to learning new skills or achieving competence in a content area or on a task. Performance-oriented goals lead students to focus on outcomes, using performance as a way to validate their own abilities (especially when they perceive their abilities as low). Having performance-oriented goals may lead students to avoid tasks they deem challenging, or to quit after negative feedback or a low grade. In extreme cases it may lead to feelings of helplessness. According to this framework, students' goals influence how they approach learning contexts. Students may engage in learning tasks to develop competence by learning as much as they can (mastery goals), even if the task is difficult and they confront setbacks along the way; or they may focus on trying to outperform others (performance goals), select easy tasks, or use shortcuts to succeed, with a focus on demonstrating competence. In typical classroom situations—and especially in challenging situations—research has found that students with mastery goals will perform better. Indeed, mastery goals predict better performance, and improvement over time; performance goals—particularly those associated with ability rather than outcome—predict helplessness and poor performance when students believe that success is unattainable.

The effects of students' goals on performance are further qualified by intersections with achievement motivation (i.e., approaching success versus avoiding failure), creating a four-square framework of goal-achievement categories:



Reassure students that mistakes and errors are opportunities to learn and clarify misconceptions rather than reflections of their ability.

1. **Mastery-approach:** desire to achieve personal or task competence
2. **Performance-approach:** desire to achieve competence in comparison to others
3. **Mastery-avoidance:** desire to avoid personal or task failure
4. **Performance-avoidance:** desire to avoid failure in comparison to others

Research supports that these categorical refinements predict academic outcomes differentially, such as study strategies, cognitive processing, and retention. Mastery goals predicted deeper processing, and long-term retention of course material compared to performance-avoidance goals, which predicted surface processing and worse retention and exam performance. Performance-approach goals predicted surface processing yet better exam performance. Mastery- and performance-avoidance goals appear connected to dispositions of fear of failure and low self-determination. Students with mastery-avoidance goals reported feelings of investment and interest in their class although they also reported disorganized studying and anticipatory test anxiety. Elliot and colleagues concluded that performance-avoidance goals had the most negative consequences of the four categories.

Achievement motivation is also directly related to intrinsic motivation. Performance goals predict low intrinsic motivation and mastery goals predict high intrinsic motivation. Mastery goals mediate the relationship between intrinsic motivation and academic performance. This suggests that students' intrinsic desire to learn drives their goal to attain mastery of their course material which, in turn, enables them to perform well academically. Students with performance goal orientations are more likely to cheat than students with mastery motivations.



Mastery goals predicted deeper processing, and long-term retention of course material compared to performance-avoidance goals, which predicted surface processing and worse retention and exam performance.

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What We Believe About Our Students and Expect from Them Affects Their Learning Opportunities, Motivation, and Learning Outcomes.

People are often unaware of their biases. And yet, our biases can change how we teach and how our students learn.

Here are some strategies you can use to ensure that this doesn't become a problem:

- To minimize the effect of existing expectations on student performance, implement procedures that ensure equal treatment of students. For example:
 - Randomly select students to answer questions posed in class (as opposed to inviting or encouraging “higher-performing” students to answer the more challenging questions), ensuring that everyone has a chance to participate equally in class discussions; or
 - Implement the “jigsaw classroom” in which each student is expected to learn and teach a part of the lesson to others in their group.
- Use grading methods that reduce unconscious bias. For instance:
 - Use anonymous grading, objective testing, and grading exams question by question rather than student by student; and
 - For assignments involving potentially subjective evaluation, such as essays or reports, limit bias by using anonymous grading and structured rubrics that facilitate more objective assessment (though see the chapter on setting goals regarding rubrics).
- Employ empirically validated strategies to reduce the impact of stereotype threat.
 - Present tasks as being “gender fair” or “race fair;”
 - Make students’ threatened identities less salient by encouraging them to think about their unique qualities, emphasizing social identities that are associated with positive stereotypes (such as reminding female students about to take a math test that they are college students—a group associated with high math performance);
 - Create identity-safe spaces; and
 - Have students affirm important personal values they hold, and promote a growth mindset (see our section on what students believe).

- Give students “wise feedback:”
 - First describe the nature of the feedback (e.g., explaining that the submitted work has not met all the requirements);
 - Next, communicate high expectations for the student; and
 - Finally, reassure students that they have the ability to achieve those high expectations.
- Identify similarities between yourself and your students. The more similarities you find, the more likely you’ll be to perceive strong relationships with those students, and the more likely those students are to succeed.

WANT TO LEARN MORE?

Instructors often have expectations about their students’ abilities and potential. Having these expectations can bias instructors to seek out information that confirms those beliefs and ignore or dismiss information that contradicts those beliefs (i.e., confirmation bias). Further, instructors’ existing beliefs shape how they teach, place students into work groups, formulate learning outcomes, and evaluate their students’ knowledge and skills. In short, expectations influence how instructors treat students. For example, when instructors believe that a student is more likely to succeed academically, they offer more emotional support, clearer feedback, more attention, more time, and more learning opportunities. This differential treatment may contribute to widening achievement gaps over time. In effect, instructors can consciously or unconsciously create self-fulfilling prophecies, or realities, based on their expectations of their students.

Where do instructors’ expectations about individual student ability come from? They may be based on students’ past academic performance or preparation, but they may also derive from explicit or implicit stereotypes about race, gender, socioeconomic status, or disability. Indeed, being in a situation that activates negative stereotypes about a group that students identify with (e.g., African-American students taking an intelligence test or female students taking a math test) can cause students to ruminate about these stereotypes, dwindling cognitive resources that students could use to accurately demonstrate their knowledge and skill. This stereotype threat also can increase students’ anxiety, undermine their motivation, and reduce their sense of belonging within an academic institution or within a particular classroom. Thus, instructors’ expectations interact with many factors that can influence student success. Some related factors include social contexts that relate to the classroom, students’ interpersonal relationships, and students’ emotional well-being.

Not only do instructors’ expectations affect students’ performance and learning, but students’ expectations about their instructors’ beliefs about their students’ potential could also affect student success. Emerging research suggests that students who believe that their instructors embraced a growth mindset about their students’ learning of statistics performed slightly but significantly better than students who believed that their instructor had a fixed mindset towards student learning.



Our Students Should Set Both Near-Term and Far-Future Goals

We know that setting goals can improve motivation, and so our students can benefit from setting goals in the short term and long term. You can do a lot to support a student in becoming a learner who effectively employs goal-setting, including scaffolded activities that encourage the setting of goals during a course.

Here are some ways that you can scaffold goal-setting activities in your classroom:

- Keep a written record of goal progress and check it regularly.
- Organize the written record to display the connections among the goals. Some students may benefit from using web-based tools that support self-regulation of progress through a series of related goals (for example: Nudgemail www.nudgemail.com or Trello www.trello.com).
- Frame initial goals for new, highly complex tasks as “do your best” goals, and be sure to give frequent and quick feedback on how their performance relates to the criteria being used for assessment. As students come closer to achieving proficiency on that complex task, shift to more specific, measurable language. The more proximal the goal, the more specific the language needs to be.
- Use strategies such as mental-contrasting with implementation intention (more commonly known as Wish, Outcome, Obstacle, and Plan, or WOOP), to help students actively plan strategies for overcoming anticipated obstacles. Check out this [Learning Scientists blog about WOOP](http://www.learningscientists.org/blog/2017/7/4-1) (www.learningscientists.org/blog/2017/7/4-1) and this activity from Character Lab (www.bit.ly/woop-for-classrooms).
- When you provide feedback, be sure to also help scaffold self-assessment in the student reflection process. When you can, give your feedback in a dialogue format, rather than in a rubric. While rubrics are helpful and can be used to guide your own grading, students will often treat the rubric as a checklist, and then fail to engage in deep reflection needed to support learning. Save the rubric for summative assignments rather than formative ones (though see the chapters on timely feedback and what we believe about our students).

WANT TO LEARN MORE?

All of us rely on goal-setting as a way of reaching some desired outcome, and students are no different. Some goals have to do with “today” (e.g., I will learn a dozen key terms in the memory chapter today and be able to give examples), and some are years away (e.g., I want to earn a Ph.D. before I am 30 years old). It’s well-known that goals can serve as motivational tools, as long as they are paired with some decent self-regulatory capacity. It’s those self-regulatory skills that seem to connect the goal to the outcome. The goal motivates students to reflection which leads to supporting achievement of the goal. Then the self-regulation seems to help the student put those

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plans into action. Well thought out student plans connect goals in a contingent fashion, so that they can see the link between learning a dozen key terms today to the ultimate outcome of a Ph.D. years later.

Effective goals tend to include at least three important features. It is helpful first to look at how a “list” of goals really fits together as a set that is linked and sequenced. Although loads of research suggests that the “today” sort of goal (a “proximal” goal) is more effective than the far-future goal (a “distal” goal), the actuality is not that simple. Taken at face value, it suggests that a good student can really only plan for the near-term. But this approach would produce students that have to keep stopping to regroup and plan again after they achieve each goal. That sort of stop-and-start approach wouldn’t help student sustain a flow of energy toward an outcome for the long haul. The more helpful way to understand this is that proximal goals are most effective when they provide a contingent link to a more distal goal. Setting proximal goals together with distal goals is developmentally appropriate for adult learners and helps keep energy moving toward both near and far goals.

Once the goals are seen in this sort of sequence and flow, it’s good to check if the goal is specific enough to track progress towards it. Students often are great at identifying the general direction they

want to go (e.g., “I’m going to do my best in that class!”), but may struggle to articulate the behaviors that are needed to move in that direction (e.g., “I will complete five practice problems in statistics with 80% accuracy”). Pushing learners to make goals specific enough that they articulate the behaviors that need to happen can better help them to put their energy into behaviors that make a difference. This specificity seems especially helpful when tasks are concrete. When tasks get more complex (such as writing an integrative literature review), the broader “do your best” goals may have more value as they shift attention back to the task rather than the more finite

performance goals well-suited to specificity.

The third critical factor to incorporate into successful student goal setting is feedback. Meaningful feedback will really animate the pursuit of the goal. But what makes feedback meaningful? The most useful feedback to students will happen quickly, frequently, and will be action-oriented. Just telling them what they did wrong doesn’t help them re-direct their energy. They need to know what went wrong in real-time, while it still matters to them, and it needs to point them in a better direction. This is another reason contingent goals can be so helpful. Students will really appreciate having a chance to respond to feedback with corrective action in future, contingent assignments that help them see how past failures to achieve a goal link to their current learning experiences.



Pushing learners to make goals specific enough that they articulate the behaviors that need to happen can better help them to put their energy into behaviors that make a difference.

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The Importance of Social Context, Interpersonal Relationships, and Emotional and Physical Well-Being



Learning is Situated within Multiple Social Contexts.

The social contexts in which your students are situated affect their learning, and understanding their backgrounds can help you communicate better with your students. Clear communication is essential. Expert educators should be mindful that classroom policies and assignment information that are clear for traditional students may be less clear for others.

Here are some ways that you can make classroom policies, assignment requirements, and grading criteria clear for all students, and ways to learn about students' backgrounds:

- Strive for clarity with classroom expectations and grading.
 - While most educators may presume students will ask questions when some expectation is unclear, empirical evidence shows that some students may be hesitant to ask for assignment or grading clarification.
- Strive for clarity on course syllabi about how students can and should communicate questions as well as what office hours are set aside for.
- Consider having multiple types of documents providing instruction for papers or assignments to communicate expectations to diverse students. One document, for example, could provide a brief outline for the assignment whereas a second provides more precise detail about what should be included.
- If you prefer a less structured approach to assignments, an alternative may be to allow students to resubmit assignments or retake exams (with different questions).
 - Interestingly, some have found that allowing exam retakes, where the retake occurs on a later date, doesn't necessarily increase faculty's amount of grading and may benefit all students, especially if students have the option of taking only one of the two exams. In this situation, students who have demanding social contexts outside of class may be able to take the exam that best fits their particular schedule.
- Communicate in a way that is clear and accessible to learners with distinct backgrounds.
 - When addressing students' questions, try to rephrase the information instead of repeating or adding additional information.
 - Ask students whether an answer has addressed their questions, and whether they have new questions.
- Seek opportunities for yourself to become better educated, to build awareness and understanding about your students. This can lead you to new insights and connections, where social connectedness and a sense of inclusion may be especially important for student retention and ultimate academic success.
 - Take part in workshops about campus diversity.

- Learn about multicultural activities and student services on campus.
- Be a visible member of the campus community at multicultural events.
- Know about the student support services at your institution. Students may be unaware of the available resources. You can help vulnerable students by being familiar with these resources and able to direct them to sources of assistance.

WANT TO LEARN MORE?

Behavior is influenced by individual characteristics and situational factors. Accordingly, students' behavior (e.g., attention, classroom demeanor, willingness to seek help, study habits) emerges from their own personalities, experiences with primary and secondary education, self-relevant beliefs, self-concept, and culture, which interact with specific contexts that occur within the classroom and within students' immediate life. The complex interaction between these many contexts may influence their learning. Understanding the unique social contexts that your students have experienced and presently experience may allow you to better communicate with students and develop curricular content that students find more meaningful and engaging.

Learn as much as you can about the students that your institution serves, as basic demographic differences will relate importantly to varying social contexts that may be relevant to the classroom, and for effective pedagogy. For example, students who are at a primarily residential liberal arts college will usually exhibit marked differences in social activities, goals, motivation, and other situational factors compared to students who are enrolled at a primarily commuter-based community college or public university campus. The varied social contexts in a student's life have consequences for learning and college degree progression. Residential students who make stronger social connections at their college or university tend to persist more with their studies and are more likely to attain academic goals than those who lack social connections. On the other hand, commuter students tend to exhibit lower achievement, which may be tied to their lack of on-campus social connection. This is also true for students who are members of minority groups or are immigrants, where such students' academic success is associated with their forming social connections with other, similar students. Other social and situational factors likely influence learning and academic success among commuter students. These students may be more likely to balance work with academic responsibilities, diminishing their abilities to devote attention primarily to their education.



Understanding the unique social contexts that your students have experienced and presently experience may allow you to better communicate with students.



A student's family background is one of the most important social contexts influencing learning and academic success in higher education. People learn about expectations, values, and sources of motivation through family experiences, including those experienced as a child. These experiences can have lasting impacts on how students frame and value education. For instance, some students may learn to value knowledge whereas others learn that education is a means to an end, such as a way to enter a career with higher earning potential. Family social contexts can also play a role in how students understand their relationship with instructors. For example, students whose families have a history of college education tend to understand and approach interactions with instructors differently than first-generation college/university students. Studies have shown that first-generation students especially benefit from instructors who provide more specific information about assignments and grading.

Many other social contexts can influence students' learning. The class composition can lead some students to feel more similar or different from their class peers. This could influence their participation and sense of inclusion in the class. Learning doesn't occur in isolation from factors outside of the classroom, either. The social situations that arise in each learner's life can influence academic performance, engagement in class, and performance. Students who have significant responsibilities or sources of stress in life beyond the classroom may be particularly vulnerable. Students who are responsible for children or older adults, who work, or who have family members with a significant or chronic illness may be less able to attend fully to their studies. In sum, there are many social factors that intersect in a student's life to promote, distract from, or inhibit learning.

The diverse social contexts that students experience and have experienced carry over into the classroom in many ways. The key message with mindful teaching is that expert educators should consider the types of students in their classes and seek to understand how these students' unique backgrounds and current life circumstances may influence their learning, preparation for college success, and interaction with instructors. Awareness of these varied social contexts relevant to one's students may allow relatively minor adjustments to teaching and curricular materials that will help all students better succeed.

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Educators should consider the types of students in their classes and seek to understand how these students' unique backgrounds and current life circumstances may influence their learning, preparation for college success, and interaction with instructors.

Interpersonal Interactions in the Classroom Can Foster Learning.

The classroom environment is inherently an interpersonal one. It involves relationships between the instructor and the students, as well as relationships among students.

Here are some strategies you can use to ensure that you are successful at developing appropriate classroom interactions:

- Establish rapport:
 - Learn about your students' interests and make course material personally relevant to them if possible;
 - Arrive early and stay late to chat with students;
 - If you're comfortable with it, use humor to lighten up the mood of the classroom; and
 - Use active learning methods to encourage discussions and interactions, modeling enthusiasm toward course material, and being respectful to students.
- Incorporate cooperative learning tasks in your classroom, especially for difficult concepts.
 - Ensure that the task is well-structured;
 - Explain to students why this method helps them learn;
 - Instruct them with respect to how to interact cooperatively; and
 - Impress on them that it's crucial for each of them to participate fully.
- Ensure that groups working together are small and hold students individually accountable for their work, to avoid social loafing among group members.
- Consider the students' cultural values when designing cooperative learning tasks. For example, tasks that expect students to openly challenge each other's opinions might not work well for students from collectivist cultures, where conformity and maintaining social harmony are highly valued.
- Encourage students to engage in effective learning strategies when structuring group activities. Group activities that promote retrieval practice will be particularly effective.

WANT TO LEARN MORE?

Positive classroom experiences are associated with better learning outcomes, greater student satisfaction, and higher student retention. Greater rapport between instructor and students, in particular, predicts better academic performance as well as greater student motivation and engagement.

Interactions among individual students can matter, too. Specifically, methods that involve students learning from one another in a collaborative fashion can improve academic achievement, promote positive attitudes towards learning, increase active participation

and conscientious effort, and foster motivation and persistence. Some examples of cooperative learning are "think-pair-share," which requires students first to analyze a problem independently, then to discuss it in pairs or small groups, then to share with the entire class; the "jigsaw classroom," which entails making each student responsible for teaching a part of the lesson to the rest of their group; and "peer instruction," which involves having students answer multiple-choice questions individually, then discuss their answers with a small group, and then answer the questions again. Many of these methods may promote learning by requiring students to actively discuss their reasoning rather than passively listening to the answer, and, importantly, because they provide students with ample opportunity to practice memory retrieval. While group work can be effective, the extent to which it is helpful to learning is highly dependent on the instructor's input and scaffolding of the activities.

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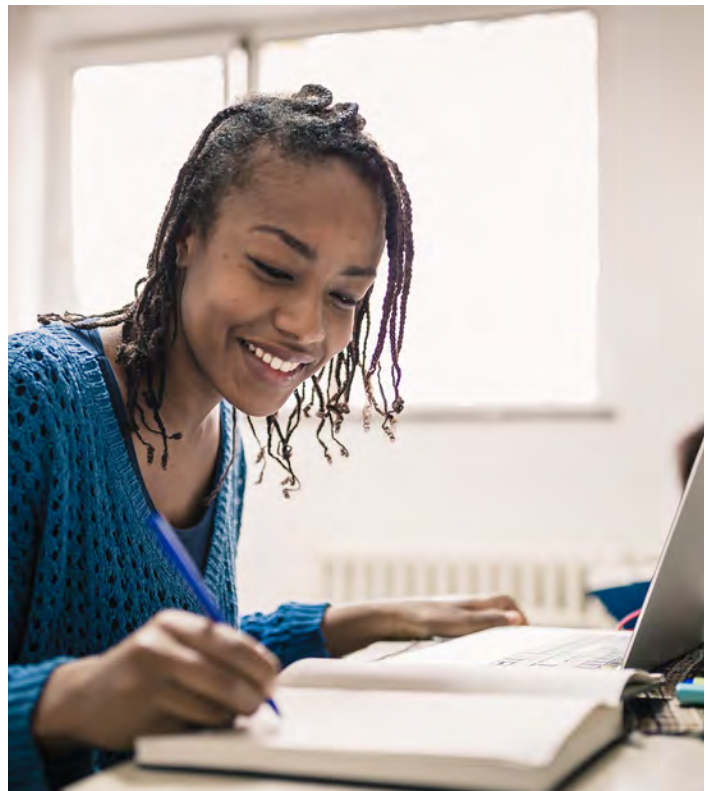
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Students' Performance, Learning, and Development are Influenced by Their Emotional Well-Being.

Student's emotional well-being can influence their participation in the teaching-learning process, response to graded assignments, self-directed appraisals about their abilities, and approach to handling academic setbacks. Concurrently, the classroom climate and interactions with instructors can provide students with a sense of support, acceptance, security, and control over their education and academic tasks. These all contribute to students' emotional well-being. Finally, the broader college or university campus climate can influence students' emotional well-being and have implications for learning, retention, and academic success.

You can facilitate your students' emotional well-being if you:

- Establish clear channels of communication students understand, can access, and are maintained throughout the semester (for example: provide specific contact information with information on how long students should expect to wait for a response, and being available during indicated office hours).
- Establish clear expectations about grading, and assignment and exam deadlines, and avoid altering these deadlines during the semester.
- Communicate how students can access campus resources relevant for academic success (such as tutoring centers, technology-related assistance, librarians) and personal well-being (such as counseling and wellness centers).
- Reach out to students who may benefit from student success resources early and promptly when academic performance suffers (for example: attach a pamphlet or provide a URL for campus writing center if a student earns a poor grade on a writing assignment early in the semester).
- Use the "sandwich approach" for feedback when grading—identify some strengths in the student's work, then delineate areas where improvement is needed, and conclude by identifying some strengths the student can build on.
- When meeting individually with students, acknowledge the student's emotions when these are brought up, but refocus the discussion on specific, tangible information (for example: what factors determined a lower versus higher grade, what specific actions the student can take to remedy a difficult situation or improve performance).
- Emphasize specific actions students can take to achieve their goals.
- Model appraising stressors as challenges rather than threats (for instance: share an example of your own academic struggles and explain how you found ways to succeed or emphasize when students met a challenging exam or assignment and were able to do well).



- For group work, assign groups to match different types of students so that groups are comprised of some students who are academically strong with those who may be academically weaker.
- Be mindful of self-fulfilling prophecy when interacting with students—try to encourage all students to challenge themselves and strive to achieve stronger performance (see the chapter on helping students work toward mastery goals).
- Understand the campus climate as it relates to student diversity—minority students (to include those who may not be traditional minorities at some institutions) may experience situations outside of the classroom that have impacts on their emotional well-being.
- Take advantage of campus opportunities for diversity and inclusion training.
- Model inclusive teaching and critical thinking by discussing multiple perspectives and avoiding personal biases, especially when discussing difficult or controversial topics.

For further consideration about how to work with a student who is in an emotional state or otherwise distressed, consider Pryal's *Chronicle of Higher Education: Vitae* column from October, 2015 (URL: <https://chroniclevitae.com/news/1144-we-are-not-prepared-for-students-in-distress>)

WANT TO LEARN MORE?

People experience emotional well-being when their daily activities are accompanied by predominantly pleasant emotions. Those who experience generally more pleasant emotions associated with emotional well-being tend to better respond to new demands, experience less distress when encountering traumatic life events,

and have better physical health. Each student's emotional well-being is complexly linked to factors that manifest inside and outside of the classroom, to include life experiences, various sources of stress, family and peer relations, self-concept and self-esteem, and personality. For example, people differ in terms of how intensely they feel their emotions. Some individuals experience strong emotions (high affect intensity) while others experience more subdued emotions (low affect intensity). Those who experience high affect intensity tend to be more prone to experiencing invigoration from pleasant emotions as well as detrimental effects from unpleasant emotions (for example, tending to rate problems in life as being more severe). Accordingly, emotions have a powerful influence on how people think, which in turn influences a variety of psychological processes relevant for student success.

Foremost, emotional states relate to cognitive appraisal, stress response, and motivation. This is well-illustrated by the cognitive appraisal stress model, where an external stimulus that evokes stress (such as an exam or major assignment) elicits a mental appraisal of whether the source of stress is more a threat or more a challenge. People who have greater emotional well-being are likely to feel a greater sense of optimism in the face of stressful situations, especially when those situations are related to an obstacle or setback related to one's goals. Through their underlying optimism, people with emotional well-being are more likely to appraise stress sources as temporary problems that are tied to a specific situation and are thus able to be resolved through sustained effort. Accordingly, people who experience emotional well-being are more likely

to feel motivated to engage sources of stress as challenges to be met rather than difficulties to be avoided. In contrast, people with less emotional well-being may be more prone to pessimistic thought, which tends to relate to stable (fixed and cannot be changed) and global (pervasive) ways of assessing stress-inducing situations. By interpreting the source of stress as something stable as well as something that has pervasive repercussions for one's life, people who have a more pessimistic emotional style are more prone to appraising stress sources as threats to be avoided.

Importantly, emotional well-being is not tied to pleasant emotions alone. Indeed, contemporary research in psychology identifies how unpleasant emotions serve an adaptive purpose that aids people in successful goal pursuit. For example, unpleasant emotions seem to serve as an alert, redirecting people's awareness to situations that impair one's success at achieving goals. By redirecting attention to problems relating to goal pursuit, unpleasant emotions allow people to reconsider their actions, adjust their behaviors, and find new ways of acting and thinking to best overcome a given obstacle.



People who experience emotional well-being are more likely to feel motivated to engage sources of stress as challenges to be met rather than difficulties to be avoided.

In this respect, emotional well-being seems to be linked to other psychological phenomena that are important to successful goal-pursuit, including motivation, self-control, self-efficacy, coping skills, and self-awareness. In a broader sense, emotional well-being further relates to favorable outcomes related to social interactions, where a stronger ability to identify unpleasant emotions signifying a problem (such as a dispute arising in a group project) permits people to reappraise the emotions, ways of thinking, and behaviors to adjust these in service of pursuing a final, desirable outcome. In the context of social interactions, emotional well-being may thus relate to capacity for perspective-taking, empathy, and successful conflict resolution.

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Students Suffering from Homelessness, Food Insecurity, and Poverty Require Special Support

Predictability and stability are essential psychological needs that enhance one's ability to learn. Students' needs for a safe home and enough nutritious food must be met in order for them to be able to concentrate on their schoolwork. However, among the most difficult hidden problems that college students face are homelessness and food insecurity, brought on by poverty.

Here are some ways that you and your colleagues may become familiar with indicators of homelessness or food insecurity in your students, and how best to be of assistance:

- Work with your Dean of Students, Counseling Center, Student Health Center, and other appropriate offices to understand the prevalence of homelessness and food insecurity on your campus, and what signs to look for in your students.
- Learn about resources available on your campus and in your community for helping students in need of assistance. These might include:
 - Federal, state, and local assistance programs;
 - Scholarships and other financial assistance;
 - Food banks;
 - Support networks; and
 - Academic and personal advising and counseling.
- Download and familiarize yourself with the excellent materials available at College Access and Success for Students Experiencing Homelessness: A Toolkit for Educators and Service Providers (www.bit.ly/naehcy-college-access-toolkit) by Christina Dukes (2013) with the National Association for the Education of Homeless Children and Youth.



In the United States, 71% of undergraduate students reported working while enrolled in school in 2011.



WANT TO LEARN MORE?

At our community colleges, our smaller liberal arts and technical colleges, and even at our elite colleges and universities, many of our students don't have a secure place to live. Many live in their cars or spend nights sleeping on the couches of different friends, while using gym facilities to maintain their daily hygiene. This can cause sleep deprivation problems, which may have devastating effects on students' ability to perform in our classes. Many faculty members don't realize quite how many of our students are also going hungry. At some universities, as many as 39% to 48% suffer food insecurity, which has major impacts on their health, their social lives, and their ability to concentrate or perform at their best.

While many students are hungry or homeless, many more are working, sometimes full-time jobs or multiple part-time jobs, to support themselves while in school. This coincides with continuing rises in tuition and costs to attend school. In the United States, 71% of undergraduate students reported working while enrolled in school, and 20% of students reported working full-time in 2011. Working while in school, especially longer hours, is often associated with lower academic success at the college level. This relationship may be particularly strong for first-generation college students.

To combat these problems, some colleges and universities have created student food banks. A few have provided free housing for students in emergency situations. At others, an institutional commitment has not been as forthcoming, so other organizations, charities, and religious groups have taken up some of the challenge, or the colleges have partnered with such groups. However, these interventions aren't always sufficient or effective, and even when help is available, not all students know about the possibility of assistance or are willing, for whatever reason, to avail themselves of it fully.

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Managing our Classrooms



We Must Teach New Students to Adhere to Basic Standards of Classroom Behavior Using Direct Instruction and the Principles of Behavioral Learning.

Much of what we know in this area can be extrapolated from research conducted with younger students, but it's clear that appropriate behaviors in the classroom and larger educational environment are necessary for academic and personal success to be achieved.

Here are some steps you can take to encourage appropriate student behavior:

- Enumerate standards of behavior, both on campus and in the classroom, in clear and unambiguous ways that are accessible, readily available, and digestible. Student code-of-conduct resources as well as individual course syllabi are a primary avenue for delivery of such information. Further, these resources should be consistent with each other so that classroom policies exist in parallel, rather than perpendicular, to larger college policies.
- Help students understand the process by which disruptive behaviors will be addressed. These include both in-class and out-of-class interventions. This requires constant and consistent communication. Students may enter unaware that behaviors that they regard as acceptable create issues in the classroom. Don't surprise students "after the fact" with the information that they have caused disturbances in the class.
- Reinforce appropriate behaviors. This is far more effective than pejorative responses to classroom problems. Thus, as with most learning situations, the use of punishment should be the exception.
- Be sure that students whom you discipline receive fair treatment, even in the face of frustrating behaviors. This may include knowing that they have a right to appeal disciplinary decisions. Individual institutions should have set processes in place that guarantee appropriate responses that attend to a student's right to due process.
- Relate appropriate in-class behavior to its real world applications. This can help move a student from an external locus of responsibility (i.e., "I am doing this because they tell me I have to") to an internal locus of responsibility (i.e., "I am doing this because it is in my own best interest"). As an example, students may learn that being on-time to class is a skill that will serve their interests after college, when punctuality is an expected trait in the workplace.
- You can serve as a primary role model for appropriate behaviors by demonstrating what is expected both inside the classroom and in the world of work. Students take their cues from you, and

as such can be expected to model both correct and incorrect practices. For example, if you are continually tardy to your class, you can't expect your students to be on time. The teacher who is always on time is modeling an appropriate behavior that can be used as a learning tool.

WANT TO LEARN MORE?

A truism of the college classroom is that the environment in which one learns is an integral, contributing factor to the quality of that learning. Student success has been found to be tied to engagement, and the classroom where student conduct operates at the highest levels facilitates such engagement and success. Many students emerge from high school or return to college after many years away (i.e., non-traditional students) sometimes with low levels of understanding of how to be a "good student" in the classroom. Academic citizenship, as it might be called, comprises a set of skills and behaviors that often need to be taught. Institutions of higher education are recognizing this fact and building College Success courses for incoming students that emphasize strategies for academic achievement. Both in and beyond such courses, students need to have appropriate classroom behaviors emphasized and reinforced, both for their own success but also for that of others in the learning environment.



Student success has been found to be tied to engagement, and the classroom where student conduct operates at the highest levels facilitates such engagement and success.

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Classroom Management is a Form of Mentoring.

There are many ways to accomplish setting high expectations alongside supportive mentoring. There certainly is not single right way to do it. Implement these practices in your classroom to cultivate a demeanor that communicates humility, humor, and care. Viewed through the mentor's lens, classroom management seems less like drudgery and more like a delight. For a "starter kit" of ideas in this vein, consider Kounin's suggestion list:

- Show your students you have high "situation awareness"...that you know what's going on in the classroom at all times;
- Cope with overlapping situations (a form of quick multitasking);
- Maintain momentum in classroom activities....think about how energy will flow through a planned activity from beginning to end;
- Keep the entire class involved, even when working with one student;
- Show enthusiasm and introduce variety; and
- Be aware of the "ripple effect"...notice how reacting to positive or negative behavior in one student can affect other students in the room positively or negatively.

Later researchers have extended and expanded on Kounin's ideas, but the basic principle remains the same: maintain control with minimal pressure or stress. For folks trying to think through how else to implement this theme, some additional ideas to think about include:

- Make sure the classroom's physical arrangements are safe and organized, built around a schedule students can anticipate, and that class rules/policies are articulated clearly and reliably applied.
- Be sure your high expectations are conveyed with positivity and warmth. Offer reasons for expectations and policies, rather than just laying down the law. Reward student comments with praise and incorporate them into class content. Show them that their ideas are worth including in the content you present.
- Be accessible. You can accomplish this in a variety of ways—arrive early to class or stay late, have a quick response time to student e-mails, and so on. It may be a small thing to you, but for them to have an answer in as close to real time as when they reach out supports the development of that mentoring relationship.
- Be sure in-class activities you plan scaffold the development of student independence, rather than dependence on instructor-provided lecture. In fact, it may be better to incorporate more innovative and interactive classroom experiences over purely lecture-based instructional time. Be willing to cover less and do it better. Explain to students how you are unpacking material so they can export those strategies to learn the material you didn't get to in class.
- Be aware of your negative-to-positive ratio in remarks or interactions in the classroom. As you reflect on this, try to intentionally keep the ratio tipped toward the positive, which will build trust and express respect.



WANT TO LEARN MORE?

Classroom management, in many ways, is not all that different from parenting. And just like research on parenting styles gives an edge to the authoritative parenting style in most Western family structures, an authoritative classroom manager brings a learning edge to his or her classroom climate. What features about the authoritative style are behind these benefits?

Diana Baumrind's authoritative parenting style is characterized by having high expectations and control alongside high encouragement. These same features help create an effective learning climate in the classroom. Instructors who use this approach provide classes with clear structures, behavioral policies, and expectations. They communicate them directly and frequently. And then they follow through and enforce them. Consistently. Visibly.

High expectations, though, work best with support and encouragement that helps students use those structures and policies to effectively meet those expectations. High expectations without support can create a sense of futility, but high expectations with support are energizing and motivating. Support is communicated through strong mentoring relationships with students. Every student-teacher interaction provides a new opportunity to communicate that the student's success is the shared goal of both. Communication has to be consistent across students so favoritism is not perceived. If every piece of communication and feedback conveys the message to each student that "I believe you can achieve this lofty goal and it's my job to help get you there," students will see the structures and policies as ladders to climb towards the high expectations, not barriers or hurdles without purpose.

The structures and policies that accompany the high expectations should have reasons behind them that can be articulated in terms of how they support student learning. Policies, assignments, goals, and other structures that can't be explained in these terms need re-thinking. Even better is if those structures and activities can be sequenced so that student can see how they lead to greater degrees of autonomy in their own learning process.

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Assessing Students' Progress



We Should use both Formative and Summative Evaluation Appropriately.

As instructors, we must assess our own students' learning. Formative assessment can be used to monitor our students' learning as we progress through a course, and summative assessment can be used to evaluate student learning overall, and compare to benchmarks. However, for formative and summative assessments to be effective, they need to be used appropriately.

Here are some ways in which you can help increase your students' levels of learning and the quality of your courses through formative assessment:

- Transparency is important. Be sure your students know and understand why you've given them each lesson and assignment. This promotes buy-in, and makes them more willing participants in their own learning processes.
- Be sure that the formative methods you choose are appropriate to the type of learning you wish to promote.
- Use the evidence you collect from formative assessment to help your students understand their strengths and weaknesses and how these best can be addressed.
- Turn around evaluations quickly, and be sure that any interventions follow as quickly as possible to ensure that they will have their maximum impact.

You can improve the effectiveness of your assessments:

- Be sure to set specific, appropriate goals before designing any evaluative measures.
- Determine how you'll know whether students have met your goals, or how you'll judge the quality of their attempts.
- Use the evidence you collect from formative assessment to evaluate whether your lessons and assignments are fulfilling their intended purposes. If not, use this evidence to redesign them appropriately.

It's also important to bear in mind that summative assessments can serve several purposes:

- Final evaluation of material or skills learned in a course or unit;
- Preparation for learning new material; and
- Motivation for students' future learning in a particular area.

WANT TO LEARN MORE?

Arthur Coladarci once described education as a form of hypothesis testing. In other words, it's an experiment. We set out with a plan that we believe will succeed in teaching particular concepts, techniques, or ways of thinking, and that may or may not be successful. We use formative and summative evaluation in order to determine whether our hypothetical method was supported.

VandenBos defines formative evaluation as "a process that is concerned with helping to improve or guide the development of



a program through the use of qualitative or quantitative research methodology," and describes summative evaluation as, "...the appraisal of a student's achievement at the conclusion of an educational program." In other words, formative evaluation allows us to test our hypotheses about the success of the teaching and learning process as it progresses, allowing us to modify our teaching methods as we go. This can be done with a variety of assignments throughout the course. In comparison, summative evaluation provides a final look at the success of our process as a whole.

Formative evaluation strategies may take many forms, but are generally most successful when they mirror the format of a course's learning objectives. This would mean that courses requiring hands-on learning or critical thinking essays should use those formats for both their formative and summative assessments, rather than relying on the ubiquitous multiple-choice format. Formative evaluation strategies can be extremely effective as tools for helping student learn in online courses. Formative assessment efforts also work across many cultures. In addition to many studies done in the United States of America, successful interventions have been carried out in countries as varied as Australia, Canada, China, Colombia, Finland, Great Britain, Hong Kong, Malaysia, New Zealand, Portugal, Saudi Arabia, South Africa, and Vietnam.

Sharing formative assessments with your students can have many benefits. For example, formative strategies have been shown to increase students' learning, motivation, and levels of achievement in courses as varied as accounting, art, biology, developmental mathematics, engineering, geography, management, medical education, and psychology.

As noted, summative evaluation is our final evaluation of how well our students' learning has met our objectives. As with formative evaluation, summative evaluation can take many forms. It may come at the end of each unit in a course, where it may enhance students' motivation to learn in subsequent units. Summative assessment may also take the form of a cumulative final examination at the end of a course, or an oral examination to allow greater depth in assessing students' critical thinking abilities. Final projects and either physical or electronic portfolios can also be considered

effective forms of summative evaluation. Some researchers advocate using multiple methods when evaluating a course. An entire course of study may also be evaluated, perhaps through the use of a capstone course, project, or service learning activity. Indeed, summative assessment may also take the form of a final project for an undergraduate major, such as presenting at a conference. A masters or doctoral dissertation, with accompanying defenses, could be considered a form of summative assessment.

Some techniques work well as both formative and summative evaluations. For example, portfolios and ongoing projects are often used productively in such diverse areas as engineering, education, or psychology. Some researchers have had excellent results when students were allowed to use their summative work as formative work, for example increasing students' learning by allowing them to resubmit final essays. This combination may be seen as a scaffolded approach, which allows students to begin as novices, and work their way

up to the levels of expertise required by the curriculum.

Tests may be developed by instructors, corporations, or governments at various levels, but whether used for formative or summative evaluation, they all share the same goal. They must be designed to produce valid and reliable information about students' levels of accomplishment or understanding. As noted above, they should be closely aligned with the learning objectives and methods of the class or course of study. It is also important for any assessment to be accessible, with regard to any learning or testing disability issues.

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Final projects and either physical or electronic portfolios can be considered effective forms of summative evaluation.

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We Must be Careful to Use Fair, High-Quality Assessments to Measure Students' Skills, Knowledge, and Abilities.



As was discussed in the previous chapter, formative and summative assessments can be helpful tools in the classroom. However, the inferences made from assessments are only as good as the assessments themselves. When we use assessments that are reliable and valid, we are better able to use those assessments to make inferences about what students know and can do.

Here are some ways that you can improve the validity and reliability of your assessments:

- Make sure that the intent of the assessment is always kept in mind. What the assessment intends to measure should be clear to everyone involved with the assessment.
- Make sure that the assessment matches what was taught.
- More questions tend to be better (within reason), and assessing the same ideas with different types of questions can improve the assessment.
- Assessments that are appropriate in some situations may not be appropriate in others. Always evaluate whether the assessment makes sense in the given context.
- Do not make high stakes decisions (e.g., whether they continue in their education, graduate, etc.) by considering only one test. Instructors and other decision makers should take other relevant and valid information into consideration so that multiple indicators are being used.
- Once the results are in, instructors can look at student performance at the item level to help improve the assessment. Some questions may be too hard (e.g., no one got the answer correct, or many students provided the same incorrect answer) while other questions may have been too easy (e.g., almost everyone answered the question correctly). Eliminating these questions can help the assessment differentiate among students' skills, knowledge, and abilities.
- Continue to monitor scores to see whether there are consistent discrepancies for students of different cultures or belonging to different subgroups. If certain types of students consistently do well or poorly on a specific assessment, this may indicate systematic bias in the assessment that must be addressed.
- Remember that all assessments have strengths and weaknesses, and interpret the data in light of these.

WANT TO LEARN MORE?

Assessments are a constant topic of discussion and debate among educators, and higher education is no exception. Assessments, both formative and summative, can be useful so long as they are used appropriately. When we use assessments that are reliable and valid, we are better able to use those assessments to make inferences about what students know and can do.

For an assessment to be fair and useful, it must be valid. There are many different types of validity; for the purposes of assessment a valid measure means an accurate measure. An assessment will have high validity if it measures all of what the assessment is intended to measure, and does not measure anything unintended.

It is also important to use assessments that are reliable. A reliable assessment is essentially a consistent and dependable assessment. Creating a reliable assessment involves eliminating random error, or factors that affect the results of the assessment just by chance. For example, changes in the test-taking conditions can randomly affect a student's score on an assessment, making the assessment less reliable.

An assessment needs to be both reliable and valid if one wants to use the assessment to make appropriate inferences about what students know and can do.

An instructor utilizing an assessment must be able to clearly state what the assessment is intended to measure, and should be able to provide evidence that the assessment does in fact measure this well for all students taking the assessment. Further, any given assessment should only be used for its specific purpose. For example, an assessment that is designed to show areas of both strength and weakness for students should not then be used to evaluate a



Assessments, both formative and summative, can be useful so long as they are used appropriately.

department or professor's curriculum. The validity and reliability of assessments should be evaluated frequently, and the judgment as to whether a test is both valid and reliable should be made across a variety of situations.

Finally, it is important to remember that individual assessments will come with both strengths and limitations, and no one test will be able to provide all information that might be desired about a student or curriculum. Awareness of these points is critical; understanding the strengths and limitations of an assessment will allow instructors to communicate caveats to those utilizing the assessment, and emphasize the importance of using multiple sources of evidence for high-stakes decisions.

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