

Learning Environment Toolkit

Promoting Student Learning and Academic Well-Being at Georgia Tech



See the complete Toolkit at learningenvironment.ctl.gatech.edu



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Welcome Letter

Dear Georgia Tech Colleagues:

In 2016, the Georgia Tech Task Force on the Learning Environment issued their report stating that a culture of civility, collegiality, and respect is the bedrock of a healthy instructional environment. “To produce a positive teaching and learning environment,” states the report, “instructors and students must partner with one another in and out of the classroom. Mutual respect is at the heart of such a partnership.... ”

The Task Force recommended that Georgia Tech raise instructor awareness of the learning environment and its overarching significance in guiding our educational practices. To implement this recommendation, Dr. Rafael Bras, Provost and Executive Vice President for Academic Affairs, requested that the Center for Teaching and Learning (CTL) create a “toolkit” that would help faculty and teaching assistants create positive learning experiences for Tech students. As Provost Bras stated recently, “We must ensure that Tech is a learning environment that serves as a lasting example of our institutional values of integrity, respect, community accountability, and adaptability.”

Using evidence-based research and best practices, along with insights from faculty and students, the Center has now published a toolkit which highlights how seven dimensions of teaching impact the learning environment. This online resource can be found at www.learningenvironment.ctl.gatech.edu.

What follows here is a brief excerpt from the Toolkit with key points about the seven dimensions, comments from faculty and students about the dimensions, and teaching strategies that enhance each of the dimensions. In addition, you’ll find information about a new area of the Toolkit that is under development. In response to the initiative on “A Path Forward – Together,” the Center is now developing resources to help faculty and TAs create conditions for well-being in our Georgia Tech learning environments. We look forward to your contributions as we expand our Toolkit!

Sincerely,

Dr. Joyce Weinsheimer,



Director

Dr. David Lawrence,



Associate Director





Communicating Expectations

Studies show that students who understand their instructor's expectations for an assignment will perform better than students who do not have that understanding.



Instructors who effectively communicate how to succeed in their courses typically provide students with clear statements of course policies, share grading criteria, provide feedback on student work early in the semester, and reiterate their course learning outcomes throughout the semester.

Research shows that first-year students, first-generation students, and some international students can underperform because they do not know how to best navigate college classes. They may not know what to expect in college-level work, or may be uncomfortable initiating communication with instructors, even when they are struggling. By clearly communicating expectations to students, instructors can help remove barriers to learning for some of these students.

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Strategies

- Communicate your expectations clearly in the syllabus and on the first day of class.
- Provide explicit, detailed explanations for class assignments.
- Use Canvas to assist in communicating class expectations.
- Communicate your expectations about the role of attendance and participation in class success.
- Use class time to explain your expectations for student academic work and classroom behavior.

Advice from Award-Winning Faculty

Don't assume the syllabus is self-explanatory.



Establish a learning community in which students feel comfortable asking clarifying questions when needed.

Don't share contact information and office hours just once.



Demonstrate your accessibility to students, indicating how you can best be contacted. Show students what they can expect from you in terms of assistance and support when facing challenges.

Don't place artificial barriers between yourself and your students.



Introduce yourself, identify your personal teaching style and rules, and demonstrate enthusiasm for what and who you teach.

Don't create mystery about the grading process.



Provide clear expectations for assignments, due dates, and grading procedures.

Don't single out students who are late, confused, or otherwise different from the group.



Establish a culture of trust and safety for future engagement within the class.

Don't present yourself as the importer of course knowledge or source of information delivery.



Find out students' prior experiences and understanding of the course material, and focus instruction on student learning needs.

Don't take for granted that students will understand your expectations for class participation.

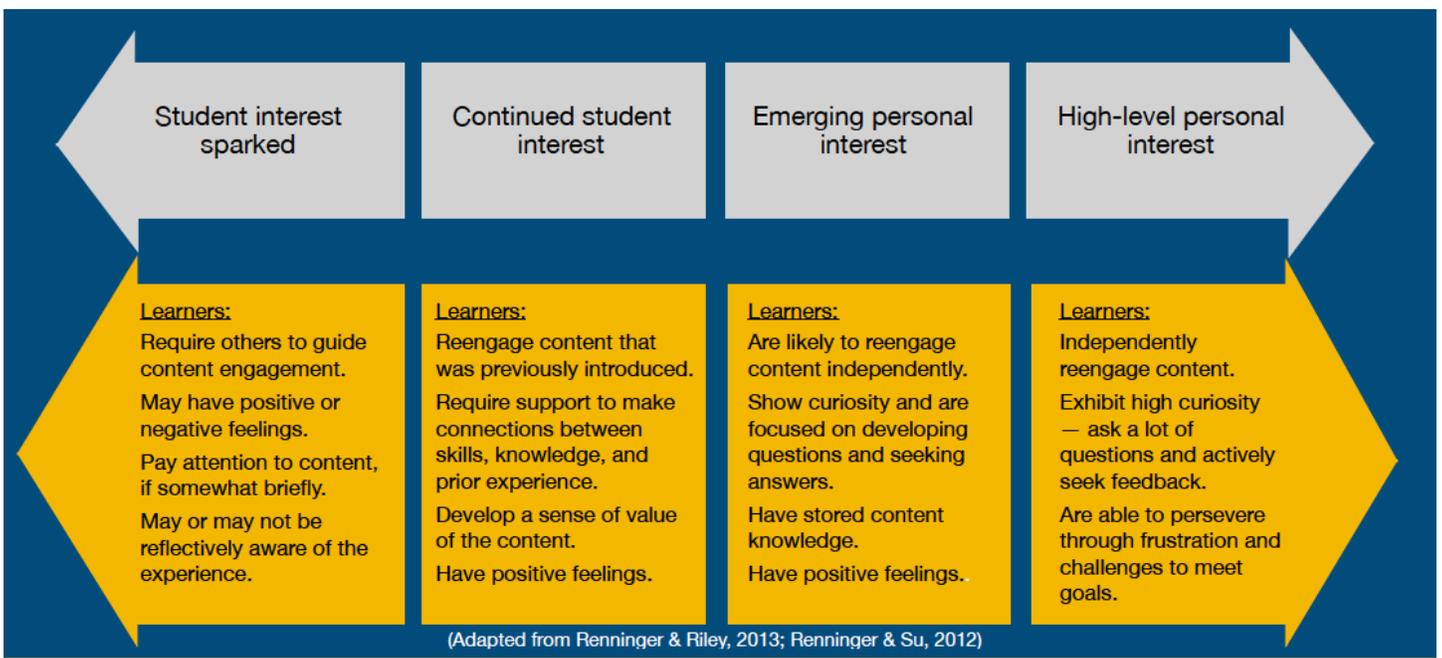


Share criteria for evaluating student participation, and establish ground rules for class discussion.



Stimulating Student Interest

When students are interested in the content they are learning, they tend to learn more. Further, student attitudes about learning tend to improve as their interest is stimulated, leading again to greater levels of learning. As student interest increases, so do other positive learning behaviors— like generating questions, independent problem-solving, seeking deeper explanations, and more. In addition, as levels of interest increase, students are more likely to engage in course-related activity (e.g., studying, working on projects, etc.) for longer periods of time – positively influencing student learning.



Strategies for Increasing Student Interest

Create active and interactive learning experiences.

Student interest in content can be triggered and maintained through experiences where students are actively engaged with content and concepts instead of passively receiving information.

Introduce moments of novelty.

Use suspense and surprise, demonstrations, stories, and videos to promote curiosity.

Construct assignments that give students some degree of choice.

Research shows that students' choice of a topic of interest to them, not just the act of choice, increases their engagement, motivation, and interest in the content and task.

Help students see the purpose and value of what they are learning.

Students take more intrinsic interest in content and perceive content to be meaningful when they can make connections to materials that are relevant to their own experiences and goals.

Generate “ah-ha!” experiences.

By layering questions and engaging students in reflection on their responses—both in class and with out-of-class work—you can lead students along a path from a starting point to a realization of something important or noteworthy about the content they are learning.

Use verbal cues to demonstrate appeal of content.

Try using verbal cues to draw student attention to important and interesting ideas with statements such as “This next topic is really key because we will return to it again and again...”

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Providing Clear Instruction

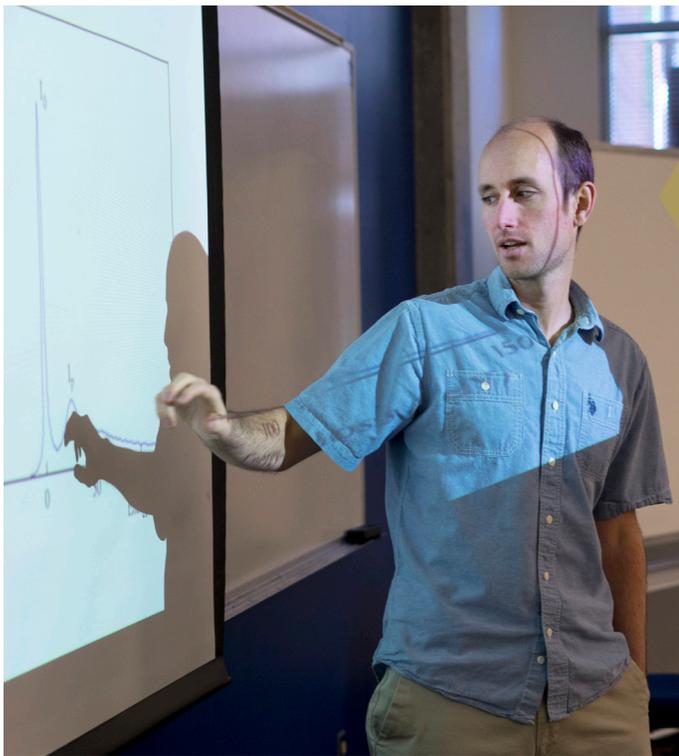
Instructor clarity and organization influence student learning and performance by supporting student motivation and information processing, and by decreasing student anxiety about the course. Making course and content organization obvious to students helps them navigate the learning process and access the right information at the right times, for the right purposes.

Students think instructors are being clear when they:

- Use examples and illustrations to explain difficult points.
- Provide clear and carefully planned explanations for abstract ideas and theories.
- Present class materials in a well-organized manner with outlines, headings, and other cues to help students follow along.
- Use questions and other techniques to check for student understanding.

Students think instructors are being unclear when they:

- Fail to align assignments with course materials and objectives.
- Use class time inefficiently or assign activities that do not support learning.
- Appear to be disorganized or unprepared.
- Do not draw sufficient attention to key points.
- Rarely provide opportunities to check for understanding.



How Can I Enhance Clarity for Students?

- **Articulate well-formed learning objectives** and use them to drive your course design decisions. See ctl.gatech.edu/resources/syllabus for learning objective examples.
- **Incorporate lower stakes assessments** prior to major assignments or tests, so that students can see what is expected of them early in the course.
- **Link current concepts and content** with both previous and future concepts and content. Build in time to make specific connections between previous course content and current material.
- **“Chunk” information into sizes that students can understand.** Arrange chunks logically and sequentially to help students see how various concepts connect.
- **Prioritize material** that supports progress toward mastery of learning objectives, and reduce superfluous content.
- **Use verbal cues** (e.g., first, next, important) to signal transitions on the board, in slides, and in handouts.
- **Provide a list of conceptual questions** students should be able to answer (or tasks they should be able to complete) by the end of the class or unit.
- **Explain concepts** with examples, models, and stories.
- **Use Classroom Assessment Techniques (CATs)** to check student comprehension while you teach. When needed, take time to revisit areas of confusion and misunderstanding.

"You have the uncanny ability to teach dense material in a way that is easy to understand, and the analogies you drew between the mechanisms and abstractions of operating systems to the functions of a toy making shop provided an avenue that helped me recall information during exams."

— from a *Thank a Teacher* note to Ada Gavrilovska, College of Computing

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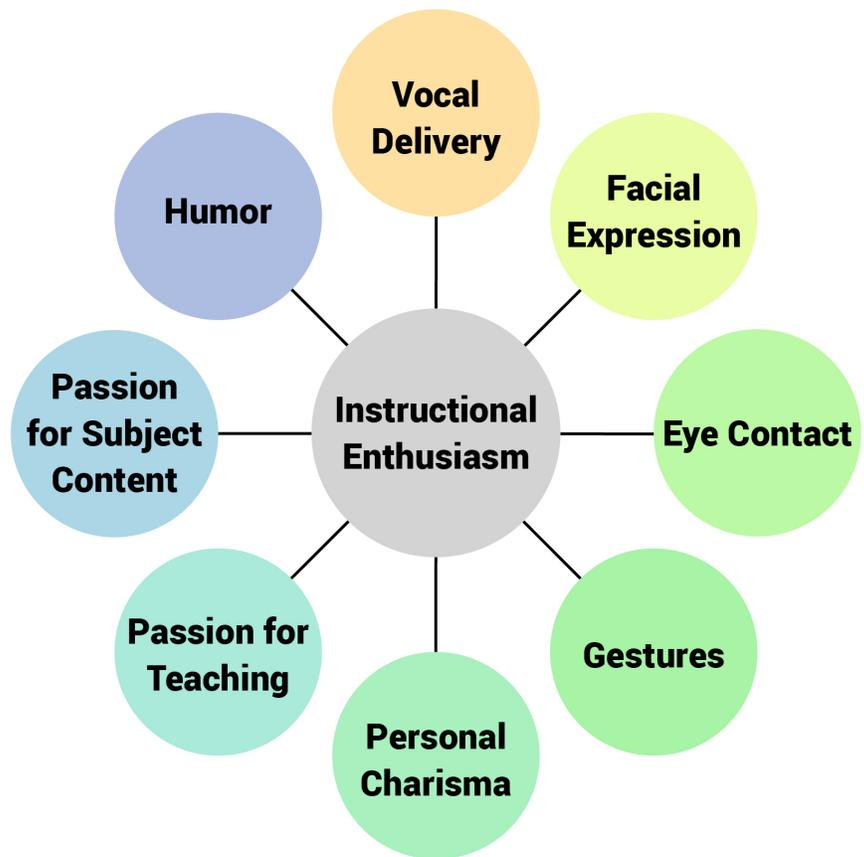


Sharing Enthusiasm

Why is enthusiasm important? When instructors bring enthusiasm—or passion—to their teaching, they tend to create environments where students are engaged and motivated, while also connecting their positive feelings to their learning goals. How do students perceive enthusiasm? Students perceive the enthusiasm of their instructor through verbal and non-verbal cues. When certain features are present (see figure below), students conclude, consciously or unconsciously, that their instructors are passionate and interested in the content and the process of teaching it.

“Your class has been incredibly exciting, not only because of the relevant discussion on modern design principles, but also because you’ve been so enthusiastic and engaging. The fact that you’ve consistently provided relevant examples from your own experience about the things we learn has been incredibly eye-opening, and I’m grateful that you always provided abundant resources in case we wanted to look further into a subject.”

— from a *Thank a Teacher* note to Robert Waters, College of Computing



The features of Instructional Enthusiasm.

Strategies

Let your passion for the subject and content guide you.

Students often view instructors as role models, so demonstrating your love for—and frustration with—content gives students permission to do the same.

Let your enjoyment of teaching come through.

Share with students some of the thought and preparation you put into the course, and some of your favorite moments from past classes.

Make connections to class material through stories and humor.

Stories and humor attract student attention, provide an anchor point for students' memory and schema building about class content, allow instructor and students to connect, and offer moments of levity that can reduce student anxiety and resistance to learning.

"This class has helped me appreciate linear algebra, and thanks to your contagious enthusiasm, I've come to enjoy the subject. I remember texting my friend right after class after learning the reason behind LU decomposition because it was so mindblowing."

— from a *Thank a Teacher* note to Yao Yao, Mathematics

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Showing Respect and Concern for Students

What does respect and concern for students look like?

- Listening to what students say.
- Providing students time to think and respond with their ideas.
- Recognizing students' ideas in a serious, valued manner.
- Exhibiting an interest in the academic success of your students.

Be consistent in your interactions with students.

Providing consistent interactions with students constructs a learning environment that students find relatable from class to class. Providing opportunities to one student, but not all, can be perceived as not caring about the academic performance of all students.

Listen to your students, and respond in a constructive manner.

Listen to students' questions so that you answer their concerns and not your perceptions, or expectations, of their inquiries. Do not engage in words or actions that embarrass or belittle students.

Learn the names of your students.

Students appreciate when you know their names and use them in class instead of just pointing at individuals. Using your students' names is perceived as an indication that you care about their presence and well-being in the class.

Keep your word.

If you make promises to students or changes to the course, be sure to follow through with whatever you said you were going to do. Your students need to know they can count on you.



“...Your demeanor and the system you create within the class structure both encourage academic and creative exploration, and foster a welcoming, engaging environment for conversation and learning. You were never intimidating or arrogant, and always welcomed thoughts and questions, and made all of our ideas feel valid and worth consideration...”

—from a *Thank a Teacher* note to Carl DiSalvo, Literature, Media, and Communication

Exhibit patience with your students.

Students will occasionally frustrate you and may even test you. Respect and concern for students means treating them as equals, and not disparaging them, even if their actions are inappropriate.

Be prepared and act confidently in class.

Come prepared to class. Coming to class ill-prepared signals to students that you do not value their time and learning needs.

Treat students as emerging professionals.

A significant factor for building respect is how you treat others. As instructors, you can establish a class environment of respect and concern by engaging students as emerging young professionals in your field.

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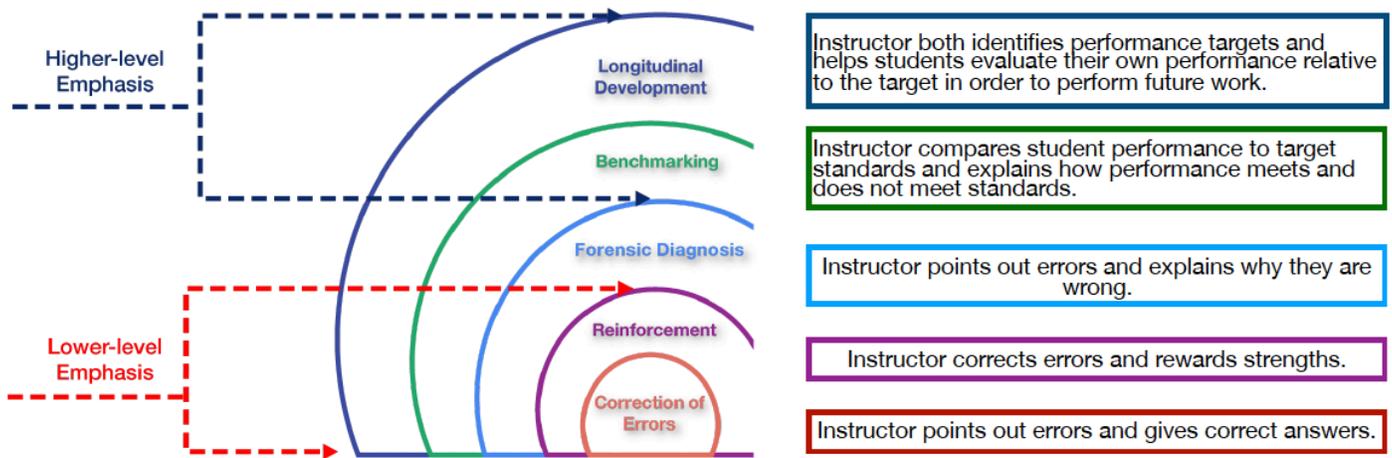
Providing Feedback

Instructors who give effective feedback to students aid their learning experience by correcting mistaken understanding, clarifying expectations, and helping students reflect on and improve their performance.

Helpful feedback contributes to learning by:

- Clarifying acceptable performance levels.
- Delivering quality information to students about their learning.
- Facilitating student self-assessment (reflection) of their learning.
- Encouraging dialogue between instructors and students and among students.
- Building student motivation and self-esteem.
- Reducing the gap between students' current and desired performance.

Nested Hierarchy of Instructor Feedback



(Adapted from Price et al., 2010)

Strategies

Help students understand the purpose of feedback.

Use some class time to discuss the role of feedback in the learning process and provide guidance for students about how to use the feedback they will receive.

Provide feedback that is instructive and encouraging.

The best feedback models how errors should be corrected and provides a path for improvement. Pointing out when students do something well supports them in continuing those practices.

Direct feedback toward relevant aspects of the assignment.

Feedback should focus on the criteria or objectives that the assignment was designed to assess, as well as suggestions for improvement on future assignments.

Be timely with your feedback.

The faster your students receive feedback on their work, the more likely they are to read it, interpret it well, and apply it to future work.

For big projects, give feedback in stages that are clear, nested, and iterative.

Providing multiple opportunities for feedback on a major project or paper enables students to make improvements and develop the ability to evaluate their own work.

"Thank you Dr. Haas, for equipping us with strong fundamentals and entertaining quips. I really liked how you would make the class interactive and help us grow with a constructive feedback after our presentations. Though the assignments were tough, somewhere while solving the questions, I also solved my dilemma of corporate vs academia. You inspire me and make me realize [that] pursuing academia could be cool!"

— from a *Thank a Teacher* note to Kevin Haas, Civil Engineering

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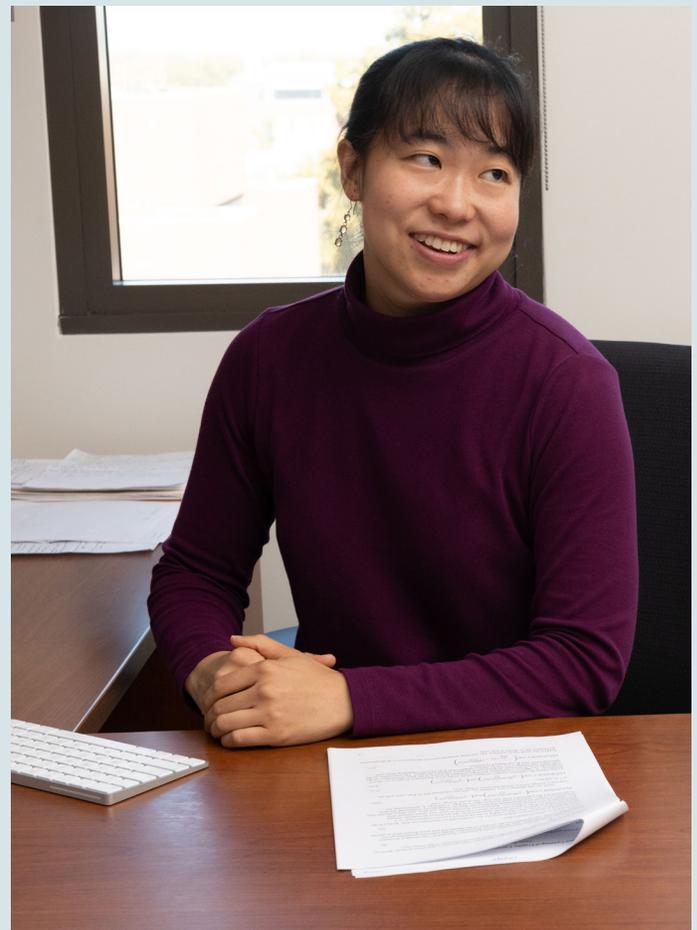
Being Available to Students

Students identify interaction with their instructors outside of their class meeting time as an important characteristic of good teaching, expressing gratitude and appreciation for this access. Instructor availability is an important way to build rapport and relationships with students who benefit from opportunities to learn outside of class meetings.



Instructor availability can positively influence student behavior in the following ways:

- Improving relationships between students and professors.
- Increasing student motivation due to the additional emotional support received for educational pursuits.
- Encouraging students to share ideas and problems with instructors.
- Improving academic performance and understanding of course content.
- Increasing student confidence in career-related decisions.
- Reinforcing academic persistence.



Strategies for Enhancing Instructor Availability

- Help students understand the purpose and value of office hours.
- Communicate your availability to students frequently and through multiple channels.
- Respond to emails in a timely and understanding fashion.
- Set students at ease and communicate tolerance, empathy, and professionalism.
- Consider student schedules, preferences, and learning needs when scheduling office hours.



“Before exams, she sends out emails to let students know when her extended office hours will be. Furthermore, to help more students, she usually has an extremely brief lunch in her office in between classes while answering students’ questions...as long as students have questions, she is always more than willing to have a little talk after class in the classroom or in her office.”

— from a *Thank a Teacher* note to Tatiana Rudchenko, Scheller College of Business

“Thank you for dedicating so much of your time to making sure that students understand the material. I really appreciated the day long office hours to help us with the project.”

— from a *Thank a Teacher* note to Adam Vitalis, Scheller College of Business



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The Learning Environment Matters



Academic Well-Being

Imagine a group of Georgia Tech faculty sitting down for lunch and having a conversation about students in their various classes. Some complaints about students might include that students appear disinterested in class, they do not prepare for class, and they seem obsessed with grades. Then, the conversation turns to a different topic—what do faculty want to see in their students? One by one, the faculty state, “I want my students to . . .”

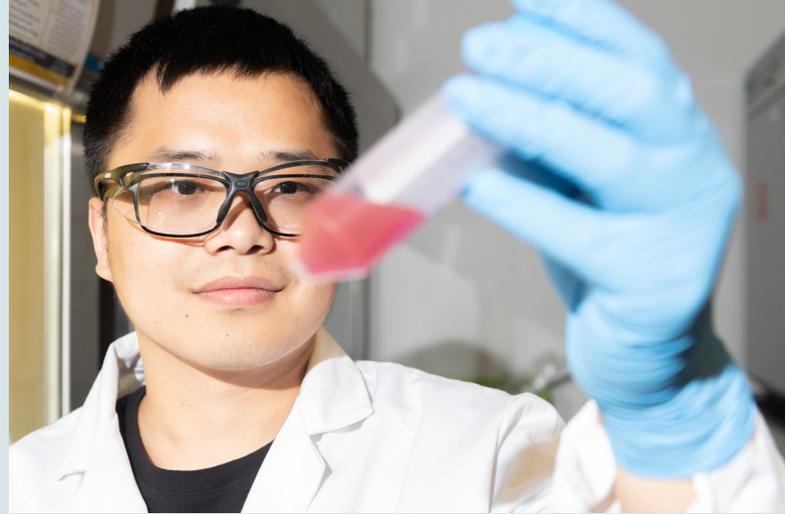
- take ownership of their learning.
- care more about mastering the material than they do about grades.
- exhibit a keen sense of curiosity and enjoyment about the content of the course.
- come prepared for class.
- engage with others and the course materials.
- thrive, not merely survive.

Taken together, these faculty responses characterize students who, according to self-determination theory (SDT), are performing with a high level of motivation. Richard Ryan and Edward Deci define intrinsic motivation as “the inherent tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn.” However, student motivation is dependent upon the satisfaction of three basic psychological needs: autonomy, competence, and relatedness. According to SDT, these needs must be satisfied for an individual to experience an ongoing sense of well-being and motivation. Within a learning environment that is supportive of autonomy, competence and relatedness, the instructor can act as a facilitator of students’ need satisfaction and optimal engagement.

Autonomy

Recently, the Teachers Insurance and Annuity Association (TIAA) conducted a study to examine how faculty member job satisfaction varies across different types of institutions. One finding, common among all institutional types, was that participants in the survey identified autonomy as one of the strongest influences in their job satisfaction. Factors contributing to this sense of autonomy included flexible schedules, freedom to create programs and curriculum, and the ability to set their own research agendas. This working environment in higher education provides a setting where faculty engage in activities based on their own decision-making (choice), volition, and interests. In other words, according to self-determination theory, the work environment satisfied the faculty's basic psychological need for autonomy, which refers to the experience of behavior as volitional and self-endorsed.

While the TIAA study examines the work environment and how autonomy contributes to job satisfaction, it is equally important to explore how learning environments either



promote or thwart a student's need for autonomy. Self-determination research reveals that, for students, academic autonomy is essential for psychological well-being and that lower levels of academic autonomy are associated with higher levels of anxiety and negative coping strategies.

Autonomy-supportive instruction facilitates a student's persistence, intrinsic motivation, engagement, use of metacognitive strategies, psychological well-being, and higher-quality learning and achievement.

Factors that hinder students' autonomy

- Emphasize different types of controls such as rewards, deadlines, grades, and evaluations.
- Use controlling language (e.g., "should," "must," and "have to.")
- Impose goals.
- Fail to provide meaningful rationales for course content.
- Assert power to overcome students' complaints and expressions of negative affect.

"No words can describe how much appreciation I have for you as a teacher. You have been patient and kind to me by being understanding of my situation and my learning style with mathematics. Your encouragement at my little successes is something I am so grateful for. You understood that I needed to study on my own for class, and gave me the time and space to figure out mathematics on my own and in my own ways without imposing rules on my learning; that is the only reason I did well in class with the number of credit hours I was taking. Thank you for being the best teacher ever."

— from a *Thank a Teacher* note to Rui Han, Mathematics

Tips to help promote student autonomy

- Provide and emphasize choice.
- Build flexibility into course design.
- Offer opportunities for self-direction.
- Provide meaningful rationales for learning activities.
- Acknowledge students' expressions of negative affect; listen to students.
- Allow students to work at their own pace.
- Frame lessons within a context of students' interests, goals, and values.
- Encourage active participation.
- Encourage students to take ownership of their learning.
- Use supportive versus controlling language (e.g., "you can learn" versus "you must learn").
- Provide options for assessment of learning while maintaining learning outcomes.
- Display patience.
- Acknowledge the students' perspective and feelings.
- Allow students to choose from various types of assessment.
- Identify students' interest and curiosity for learning the subject material.
- Use early course feedback to see what is working for students.
- Apply theories and abstract concepts to concrete, real-world examples.
- Advocate risk-taking and provide encouragement.
- Incorporate high-impact educational practices (e.g., service learning, undergraduate research, and global learning).

"I absolutely loved the design and structure of the program. Simple things made a big difference because it was designed with the 'Student first' approach. For example, posting the assignments beforehand. I was able to plan better and overall felt in control of what was to come my way. Towards the end, when an exceptional situation of Covid19 came, I felt very comfortable and taken care of with respect to the course. Quick and informed actions were taken. I believe behind every effortless system there is a lot of effort. So thank you, your team, and Georgia Tech management for the incredible program.

—from a *Thank a Teacher* note to David Joyner, Computer Science

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Competence

The need for competence refers to feeling effective and capable of achieving desired outcomes and experiencing opportunities to exercise and express one's capacities. Competence is not necessarily acquired skills or capabilities, but rather a student's perception of confidence and effectiveness toward mastery.

Factors that hinder student competence

- Giving negative feedback.
- Expressing negative expectations.
- Failing to provide clear learning expectations.

Instructor strategies that promote student competence

- Provide optimal challenges.
- Provide structured guidance.
- Provide clear goals and expectations before a learning activity.
- Offer help, guidance, and supervision during a learning activity.
- Give positive, timely, and constructive feedback after a learning activity.
- Provide examples of exemplary work.
- Provide the necessary tools for student success.
- Use various types of formative assessment (e.g., Clickers).
- Convey the same level of confidence in the abilities of all students.
- Help students connect their prior knowledge to new learning experiences.
- Provide students with grading rubrics well in advance of the assignment due date.
- Offer students multiple means of support (e.g., office hours, discussion board, TAs).



"This was probably the hardest course I've taken at Tech thus far, but you made it so much easier for me. A lot of the times I wouldn't understand a concept taught in lectures and with over a hundred students, it would be nearly impossible to take the time to understand it then and there. But in recitation, you would clarify each person's doubts personally, which was very useful for me. I love that you begin each recitation not by jumping straight to the worksheet problems but rather by explaining the concept in question briefly and clearly. It made the worksheet questions flow much smoother and helped reinforce the concepts in our minds. Most importantly though, you helped us with any kind of problems we would be facing and made not only the course but college life in general easier. Thank you so much for all your help."

— from a Thank a Teacher note to Santana Farrington, Mathematics



Factors that hinder student relatedness

- Emphasizing competition.
- Being non-responsive to or dismissing a student's perspective or concern.
- Displaying or communicating microaggressions.
- Providing little or no time for student interaction, collaboration, or teacher-student interaction.

Instructor strategies that foster relatedness / belongingness include

- Use communication behaviors that exhibit warmth, caring, support, and inclusiveness.
- Create a safe learning environment that allows students to express feelings and questions.
- Promote group work and in-class discussions.
- Display enthusiasm for the subject.
- Empathize, listening to and acknowledging students' perspectives.
- Share personal experiences, interests, and passion.
- Encourage students to attend office hours.
- Foster collaboration.
- Employ active learning strategies.
- Emphasize effort, hard work, and growth rather than intelligence and brilliance.
- Utilize interactive practices and student-centered approaches.

Relatedness/Belongingness

According to SDT, the need for relatedness refers to “feeling connected to others, to caring for and being cared for by those others, to having a sense of belongingness both with other individuals and with one’s community.” When students lack a sense of belonging, they may experience feelings of isolation, marginality, loneliness, alienation or rejection. Students with a higher sense of belonging demonstrate persistence to degree, greater intrinsic motivation, more engagement, increased academic performance, high self-efficacy, and enhanced well-being.

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Inclusive Teaching Strategies

A sense of belonging in relationship to underrepresented students is particularly important since research shows that women, students of color, first-generation students, and economically disadvantaged students are more likely to experience uncertainty about their belonging and potential than majority students. Thus, creating a learning environment that supports all students' need for belonging will foster a student's sense of well-being.

Thanks for a challenging and rewarding semester! My father was diagnosed with cancer and my sister was on a ventilator for 9 days due to COVID-19 (my dad and sister are much better now!). I thought about quitting, but seeing you and the TAs push through during this pandemic inspired me to keep trying my best. I'm so glad I did! There is much I have to learn and weaknesses I have to address, but the ability to directly apply what I have learned is invaluable.

—from a *Thank a Teacher* note to Richard Vuduc,
Computational Science and Engineering

Prof. Vidakovic and TAs, I want to thank you for creating a great learning experience in Bayesian Statistics and in particular for being flexible during the last part of the class given the difficulties caused by the COVID-19 pandemic. The way you planned and managed the class was a demonstration that we can be united and support each other without missing the importance of rigor and discipline at Georgia Tech. Thank you and best wishes!

—from a *Thank a Teacher* note to Brani Vidakovic,
Industrial and Systems Engineering



Inclusive teaching strategies include

- Learning students' names; using name tents.
- Providing opportunities for students to interact with one another.
- Avoiding assumptions about students' abilities based on stereotypes.
- Communicating high expectations and your belief that all students can succeed.
- Creating structured opportunities for students to give feedback on the learning environment.
- Encouraging students to learn and use one another's names.
- Emphasizing that challenge and struggle are part of the learning process.
- Inviting speakers that represent diverse social identities.
- Using examples, case studies, and other learning resources that reflect diverse peoples.
- Sharing power by inviting students to make decisions about curriculum, pedagogy and classroom expectations.
- Providing multiple means of access to course materials and content.

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