

Tips for a More Active Classroom

Good teaching methods and practices can help students learn more—and more effectively. These pages provide tips on how to engage students and how to make innovation work in the classroom.

GET STARTED

- Try smaller, contained activities at first.
- Provide context: Explain to students what you are doing and why.
 - Students may not be used to working in supervised teams, interactive classrooms, or open-ended problem solving.
 - Explain why the activity is useful—will it help them tackle the material now, apply the knowledge to homework or real-world problems, think more creatively?
- If it doesn't work “just right” the first time, gather data and try again.

KEEP LINES OF COMMUNICATION OPEN; EMPHASIZE PERSONAL ACCOUNTABILITY

- At the beginning of the semester, give students your name, phone number, office and E-mail addresses, office hours and other good times to get in touch with you.
- If you are using E-mail, tell them to begin checking it regularly.
- Tell students how you want to be addressed (Dr. Smith, Professor Jones, Ms. Alvarez).
- Give students your full attention during office hours and advising sessions.
 - Use attentive body language (sit forward and maintain eye contact).
 - Limit interruptions by activating your voice mail.
 - Take notes and develop an advising file for each student.
 - Help students work through problems instead of simply providing solutions.

CREATE A TWO-WAY, PROFESSIONAL FACULTY/STUDENT RELATIONSHIP

- Treat students with respect, and expect the same from them.
- Increase engagement and accountability by using student names; keep them from thinking of themselves as anonymous.
 - Use seating charts, name tags, digital or Polaroid photos—whatever helps to learn names.
 - If a student comes to your office and you don't remember her name—ask!
 - Remember that it is not just you learning their names—they need to learn each other's names!
- Gather student feedback on teaching and learning at mid-semester when you can still act on it.

USE EFFECTIVE QUESTIONING TACTICS: GOOD QUESTIONS RESULT IN GOOD ANSWERS

- Set expectations at the beginning of the course. Tell your students:
 - You may call on students even if they don't volunteer.
 - They should do their best. It's okay to say, “I don't know,” or ask for more information.
 - They should raise their hands instead of shouting out answers, encouraging participation of all learning styles.

EXPLAIN WHY YOU ASK QUESTIONS

- Questions enhance learning: we learn better when we formulate a response.
- Questions uncover misunderstandings and misconceptions that can be addressed in class.
- Questions are learning tools and not intended to embarrass a student or “test” his/her knowledge.

QUESTION EFFECTIVELY

- Be specific. Avoid simply asking “Any questions?” or routinely posing “yes” or “no” questions.
- Ask one question at a time. Avoid re-phrasing a question several ways or asking series of questions.
- Call on specific individuals; use a classroom seating chart to make sure you question all students.
- Wait at least ten or fifteen seconds for a response.
- While you’re waiting for a response, move around the room and make eye contact with students.
- Repeat students’ responses (or questions) so everyone can hear.

ENCOURAGE MORE AND DIFFERENT STUDENTS TO RESPOND

- Instruct all students to write down a response to the question. After a minute or so, ask for their answers.
- Turn wrong answers into an opportunity to enlighten, inform, and engender discussion rather than to belittle, ridicule, or embarrass.
- Encourage responses by positively acknowledging answers—even incorrect ones.
- Avoid calling on the same student all the time. If a student persists in volunteering, call on him or her twice, then say, “Thanks, but I’d like to give others a chance.”
- Keep track of whom you call on. Do you call on women and minorities as often as you do white men? Do you call on them more? (Overfocus on underrepresented groups may discourage rather than encourage further participation.) Do you rely on one student, who always does her homework, to provide answers?

EFFECTIVE STUDENT TEAMS: THE HIGHLIGHTS!

- Provide context: Explain to students what you are doing and why.
- Plan team projects that are:
 - Relevant to coursework.
 - Complex enough to require contributions from each team member.
- Set expectations.
 - There are two aspects of teamwork:
 1. completing the task (i.e., design project)
 2. learning and developing team processes (communication, leadership, decision making, equitable participation)
 - Make it clear that both aspects are equally important. Students should focus on developing both engineering and teamwork skills (and it’s up to the professor to help them learn to work in teams).
- Help teams get off to a good start. Encourage good team work by having teams:
 - Write and sign a contract to define member responsibilities.
 - Decide for themselves how to handle conflicts, decision making, and communication—then document these processes.

IN THEIR OWN WORDS • A Workshop Designed to Enhance the Learning Environment

- Acknowledge that teams require a lot of student time and occasionally provide in-class time for teamwork.
- Intervene when you see one student dominating or another not participating:
 - Emphasize privately that participation is an important learning experience and that good leadership means drawing out the best in all team members (not doing the job him- or herself.)
- Assessing teams:
 - Communicate all grading criteria to students at the beginning of the project.
 - Include both teamwork aspects plus the task as components of the grade.

BE AWARE OF EQUITY ISSUES FOR UNDERREPRESENTED STUDENTS

- Keep your expectations consistent for all students regardless of race, gender, or ethnicity.
- Remember that all students in your classroom met the same admission requirements.
- If you see a student being marginalized in a team or coursework, intervene. Remind members that success depends on everyone's participation.
- Avoid singling out students with more frequent questions or overly solicitous behavior.
- Remember that while the most visible populations are women and students of color, other students also experience isolation and marginalization (international students, first generation college attenders, students from rural areas, etc).

RESOURCES FOR MORE INFORMATION:

- Check out www.engr.psu.edu/itow for more tips on active classrooms!
- Contact offices in your college or university that specialize in learning and teaching resources, and programs that work specifically with women and students of color.

Questions or comments? Contact:

ENGINEERING INSTRUCTIONAL SERVICES

Rose Marra, Director
(814) 865-4020
rmarra@psu.edu

ENGINEERING UNDERGRADUATE STUDIES

Rob Pangborn, Associate Dean
(814) 863-3750
rnpdo@engr.psu.edu

LEONHARD CENTER FOR THE ENHANCEMENT OF ENGINEERING EDUCATION

Tom Litzinger, Director
(814) 865-4015
tal2@psu.edu

MINORITY ENGINEERING PROGRAM WOMEN IN ENGINEERING PROGRAM

Barbara Bogue, Interim Director and Director
(814) 863-5790
bbogue@engr.psu.edu

ECSEL AT PENN STATE

Jack Mitchell, Penn State PI,
Professor of Electrical Engineering
(814) 865-0345
jdm4@psu.edu