SAGE 2YC: Sustaining Faculty Learning

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Broaden Participation through Diversity and Inclusion

Open Students’ Science Identity

Students who are able to envision themselves as scientists are much more likely to graduate from a STEM field and enter a career in that field than those who do not. Helping students (and teaching students) to see themselves as scientists is particularly important for those from non-traditional backgrounds as well as those with no clear connection to a science role model.

Mitigate the Impacts of Stereotype Threat and Solo Status

Science and math effectiveness is a group about which they have no negative stereotypes, and can lower students’ performance. Encourage them to experience this aspect of effective problem-solving. Often, students’ anxiety increases when they feel they must perform above their expectations.

Support First-Generation Students and Two-year Colleges

Many students from underrepresented groups are among the first in their family to attend college. Faculty who understand how to help first-generation college students can be particularly effective in supporting all of their students better.

Design and Adapt Instruction to Make Courses Accessible

Diversity and Inclusion

The geoscience workforce is significantly less diverse than the US population, and even lags behind other STEM disciplines. There are evidence-based practices for broadening participation. This suite of pages supports 2YC faculty in implementing those practices.

Develop Students’ Science Identity

Developing Students’ Science Identity

‘A student told me recently that geoscience is a “different kind of farm” than themselves. These students might conclude they are not “farmers” even though they tend to believe that geoscience is important.”

Science Identity

Some technical approaches employ several identities when students are constructing their futures and educational pathways. One of the factors that students believe is whether or not they are aware of the perception of a career or role. If they cannot or “suffer from the stereotype” that means to them a distinct “yes,” a low likelihood that they will follow that particular path. British scientists, for example, have a more common way of describing the future of students and their careers. They are more likely to choose science rather than creative arts.

Strategies to Promote Science Identity Development

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Implement Active Learning Strategies

Research is clear: students learn more and retain what they learn longer when faculty implement active learning strategies. This suite of pages supports faculty using a variety of active learning strategies effectively and in expanding their active learning toolkit.

The information on how to use these pedagogies will include:

▪ A set of posters developed by Rachel Beane (Bowdoin College) with guidance on implementing several common active learning strategies.
▪ Recommendations about which methods are good for common teaching and learning objectives.
▪ Links to the extensive teaching modules and resources at Pedagogy in Action.
▪ Guidance from the Cutting Edge Classroom Observation Project on making a more student-centered classroom.

Implement Active Learning Strategies

Active learning is a broad term for teaching approaches that promote learning in which the responsibility for learning is placed on the student, often working in collaboration with classmates. Active learning strategies have potential over passive learning strategies, where the focus is on the student’s ability to perform for an examiner or to read information presented in a textbook. Active learning strategies include interactive teaching, which is emphasized in the following article, and interactive learning, which is often used as a Bloom's taxonomy strategy.

Active learning strategies are designed to engage students in their learning, and they are all critical aspects of different disciplines, which means some strategies may be more effective in some disciplines, while learning strategies may be less effective in others. Effective active learning strategies can take many forms, such as:

▪ Engaging with students and creating opportunities for students to engage in learning activities.
▪ Supporting diverse student learning needs and providing opportunities for students to develop their identities as scientists.

Why Use Active Learning?

The goals of education are not only clear:

▪ Student engagement with student-centered learning techniques.
▪ Engaged minds are more successful in future lives.
▪ Active learning promotes learning competencies and habits of mind that are often more applicable to employers than core content knowledge.

Develop Students’ Science Identity

Showcase Nonstereotypical Scientists

From pictures on the syllabus and website to spotlights of interesting scientists in research course content, draw students’ attention to individuals who don’t fit the scientist stereotype so that more students can envision themselves in science.

Practice Doing Science

Any activity in a course that mimics what scientists do can be used to “remind” students that they are doing science. Lab activities, field trips, even short in-class activities that involve building skills or habits of mind can reinforce students’ identity as a scientist.

Highlight Topics Relevance to Students’ Lives

Real-world examples can show how geoscience is relevant to students’ families and communities because it can address issues they care about. This kind of work transforms abstract classroom materials into concrete actions that students can relate to.

Develop Students’ Science Identity

"I think that it is important to make science accessible to all students and to show them that they can have a successful career in science." — Science et al., 2011

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In addition, resources from partners like InTeGrate and GETSI have been included to provide faculty with additional information guidance.

▪ Develop Cultural Competency
▪ Address Societally Relevant Issues

http://serc.carleton.edu/sage2yc/strengthen_faculty.html