

# STEM - FIT

FORUM FOR INCLUSIVE TEACHING

10/13/2020

## TIPS AND TOOLS FOR INCLUSIVE TEACHING

### CONCEPT

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The idea of a **Growth vs. Fixed Mindset** was introduced by Dr. Carol Dweck in 1999, and research since has provided strong evidence that mindset is linked to factors such as academic performance, goal setting, resilience and resistance. How does this concept relate to equity? Canning and colleagues (2019) provide evidence from a study with 150 STEM faculty and their 15,000 students that instructors who embrace the fixed mindset have larger equity gaps and inspire less motivation than those who ascribe to a growth mindset. The good news is that faculty can help students develop a growth mindset by the language and activities they employ.

### TIPS AND TOOLS

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- 1. Introduce the concept of growth mindset to students.** Behavioral studies show that students' knowledge of growth mindset matters. In one foundational study by Carol Dweck, Kail Trzesniewski, and Lisa Blackwell, students were separated into two groups—one group was told intelligence is fixed and the other group was told that intelligence is malleable and dependent on effort and a willingness to adapt learning strategies. After observing and assessing the two groups, researchers found the growth mindset group consistently demonstrated higher motivation toward curricular challenges and ultimately scored significantly better on assessments than the fixed mindset group. Thus, one effective strategy is to simply share this behavioral data supporting growth mindset after defining growth vs. fixed mindset for your students:
  - **Growth mindset is the understanding that we develop our skills through effort and persistence.** Students who appreciate a growth mindset are more resilient in the face of challenge and understand that they can improve their intelligence through hard work and by trying new approaches to learning. Studies centered on neuroplasticity have repeatedly supported the growth theory of intelligence.
  - **Fixed mindset is the belief that intelligence is a fixed trait.** Evidence indicates students who fall into this category often resist learning and trying to improve, and feel embarrassed when they do not understand something. Studies of brain function, learning, and memory show that intelligence is not fixed.
- 2. Foster growth mindset thinking in your class throughout the semester by emphasizing growth mindset ideologies.** For example:
  - a. Remind students that subject matter expertise is not inherent, and that they are here for those skills to be developed.
  - b. Emphasize the value of attempting different learning strategies.
  - c. Avoid complimenting intelligence.
  - d. Encourage the use of the word “yet” when students discuss not understanding a concept—remind them that they do not understand it...yet.
  - e. Communicate the value of goal setting and creating a plan to progress toward their goal.
  - f. Discuss the value of challenge by describing effort and difficulty as paths—not barriers—to increasing intelligence.
  - g. Describe mistakes and overcoming obstacles as requisite to learning and as opportunities to foster resilience.
  - h. Share instances in which you or other accomplished scientists have learned from mistakes and/or overcome obstacles.
- 3. Engage students in writing activities that explore and challenge their ideas about mindset.** See the following link for activities with embedded videos on intelligence and neuroplasticity from the University of Michigan's College of Literature, Science and Arts Inclusive Teaching initiative:  
<https://sites.lsa.umich.edu/inclusive-teaching/sample-activities/growth-mindset-activity-for-stem/>

### RESOURCES

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- The Commit to Study program in the Center for Science and Math Success has workshops on Growth Mindset for students and faculty.  
[www.csus.edu/c2s](http://www.csus.edu/c2s)
- Limeri and colleagues (2020) explore the changing nature of students' mindsets and conclude that mindsets and academic performance are deeply intertwined.  
<https://www.opencolleges.edu.au/informed/features/develop-a-growth-mindset/>
- Canning et al., 2019 demonstrate the influence of faculty mindset on student achievement and motivation.  
<https://advances.sciencemag.org/content/5/2/eaau4734>