



MOTIVATIONAL INTERVENTIONS

A pedagogical strategy “that increases students’ motivation to learn or that removes barriers to learning”

(Yaeger & Walton, 2011).

Very helpful overviews include Aguilar, Walton & Wieman (2014), Yaeger & Walton (2011) and Tibbetts, Harackiewicz, Priniski, & Canning (2016)

| Process | Challenge in STEM | Theory behind how motivational intervention can address | Sample Studies |
|---|--|--|---|
| SELF-AFFIRMATION / STEREOTYPE THREAT | If women and underrepresented minorities (URM) in STEM perceive that they are in danger of confirming a stereotype about their group, they can experience increased anxiety and reductions in performance. | Reminding people of diverse, positive aspects of themselves can lead people to see negative events and information as less threatening (e.g., reduction of stereotype threat) | On the first day and right before a midterm, intro physics students are asked to spend 10-15 min. writing about positive values (e.g., independence, creativity) that are important to them. Women’s grades increased by .33 grade points, reducing gender achievement gap by 61%. Authors suggest that the exercise reinforces that students are more than negative stereotypes about their group membership (Miyake, et al., 2011). |
| ATTRIBUTION | Students’ explanations for success or failure influence subsequent achievement. STEM students could perceive tough standards or low grades as diagnostic of their capacity to succeed in STEM. | Reframe critical feedback or adverse events as less consequential or as positive (e.g., failing one quiz is not diagnostic of one’s long-term future in the field). | Critical feedback on assignments emphasizes: (1) reflection of a teacher’s high standards, (2) students’ potential to reach them, and (3) substantive feedback to improve (e.g., “I’m giving you these comments because I have very high expectations and I know that you can reach them.”) URM students receiving this feedback showed higher revision rates and more improvement in writing, compared to those receiving standard feedback. Authors suggest that the exercise reinforces to students that critical feedback can be attributed to instructors’ high standards and belief in student potential (Yaeger et al., 2014). |
| EXPECTANCY-VALUE | Student motivation is determined by expectations for success and the perceived value of a task. STEM students may not feel they can be successful or may not see material as relevant. | Increase motivation by increasing sense of relevance and/or greater transparency on path to success. | Intro biology students were asked to pick a concept from lecture and, for homework, write about the relevance of the concept or issue to their own life, giving examples. Performance improved slightly for all students, but especially for URM (40% reduction in achievement gap) and first gen-URM (61% reduction) (Harackiewicz, Canning, Tibbetts, Priniski, & Hyde, 2015). (See also Hulleman & Harackiewicz, 2009.) |
| SOCIAL BELONGING | Because women and URMs have historically been underrepresented in STEM, it is often difficult to establish a sense of belonging. | Increase the degree to which students perceive they belong to a group and are connected to others. | Showing female STEM students images of female engineers and mathematicians improved their attitudes, identification, self-efficacy, and career interest in STEM (Dasgupta, 2011; see also Walton & Cohen, 2011; Walton, et al., 2015). |

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Other Types of Motivational Interventions

| Theory | Summary (from Lazowski & Hulleman, 2016) |
|-----------------------------------|---|
| Implicit theories of intelligence | Students' beliefs about whether intelligence is stable (i.e., fixed or entity mindset) or is malleable (i.e., growth or incremental mindset) influence goal striving, persistence, and performance. |
| Attribution | Students' explanations for success or failure influence subsequent achievement. |
| Transformative experience | Reframing the learning experience as an application of the content in a way that enhances everyday value |
| Self-determination | Satisfying students' three core needs (autonomy, relatedness, competence) are essential for promoting motivation and well-being |
| Interest | The development and deepening of interest in specific topics and academics is influenced by situational and individual difference factors |
| Goal setting | Specific, difficult task goals produce higher commitment and performance than vague goals that are easy to attain |
| Self-confrontation | Students' perception that their behaviors and values differ from their self-conception motivates change |
| Possible selves | Students' conception of what they might become (both desired and feared) serve as incentives for future behavior and a way to evaluate current behavior |
| Achievement goal | Students' goals for engaging in an activity shape how they approach, experience, and react to achievement situations |
| Need for achievement | The importance of mastery, high achievement, and besting others to reach one's full potential |

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