

Teaching to Promote a Growth Mindset

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Abstract—The purpose of this paper is to describe a special session intended to help instructors better understand the difference between fixed versus growth mindset and how instructional approaches can implicitly or explicitly promote one or the other. Originating with Carol Dweck, individuals with a fixed mindset believe that a specific ability or intelligence is innate and fixed. In contrast, individuals with a growth mindset believe that ability or intelligence can be improved with training and practice. Through implicit and explicit messages to their students, instructors may inadvertently trigger students to approach tasks with a fixed mindset. The interactive session will focus on common messages and strategies that will help students to approach tasks in a class with a growth mindset.

Keywords—growth mindset; fixed mindset; teaching strategies

I. DESCRIPTION OF SESSION CONTENT

The term “mindset” is often used both casually and in the engineering education literature to talk about the various skills and characteristics that we want engineering students to possess. Although most often used in reference to the “engineering mindset” or “entrepreneurial mindset,” the term “mindset” has not been adequately defined by the research community. Particularly in regards to the “entrepreneurial mindset,” multiple definitions exist, none of which are grounded in theory or empirical research [1]. One reason for the confusion surrounding the term stems from the entanglement of colloquial definitions of “mindset” and the psychological research into growth and fixed mindset originating with Carol Dweck’s research [2]. This paper describes a special session planned for the 2017 Frontiers in Education conference. The session seeks to clarify the definition of mindset, as defined by Dweck, and to discuss implications for instruction.

In the colloquial sense, the term “mindset” is often used to refer to the set of characteristics (knowledge, skills, or attitudes) that a person possesses. According to the Merriam-Webster dictionary, mindset refers to a “mental attitude or inclination” [3]. In contrast, Dweck defines mindset as “implicit theories about the malleability of human characteristics” (p. 302). [4]. While individuals have varying strengths regarding different abilities, those with a growth mindset believe that success on tasks can be influenced by effort and practice. In contrast, individuals with a fixed mindset believe that one’s performance on tasks is the result of innate, immutable characteristics. The important distinction with Dweck’s definition is that fixed and growth mindset refers to an individual’s beliefs about a particular

ability, rather than the proclivity for a particular ability to be more innate or learned.

Students who have a growth mindset towards a particular characteristic are more likely to put greater effort into their work and to take on challenges. While many of the studies on growth versus fixed mindset have been conducted in the K-12 population, teachers at any level can implicitly promote a growth versus fixed mindset through the messages that they provide to their students, such as language in the course syllabus, assignments provided, feedback given to students, and conversations with students about progress. [5] The FIE special session will be an interactive conversation about the growth versus fixed mindset and how instructors may unknowingly promote one mindset or the other through their instructional strategies.

II. GOALS OF THE SESSION

The intended goals of the special session follow. Participants will:

- Gain an understanding of growth versus fixed mindset, including an awareness of both classic and current research related to the constructs.
- Identify subtle and unsubtle ways that instructors may promote a fixed versus growth mindset in their courses.
- Reflect upon their own teaching to explore where they may have promoted a fixed versus growth mindset and consider what changes they may want to pursue.

The intended audience for the workshop is quite broad and would include any engineering instructor who teaches or researchers interested in the growth versus fixed mindset. In addition, because mindset is such a popular topic right now in the entrepreneurship education community, instructors and researchers in this domain may be interested in attending as well.

III. EXPLANATION OF INTERACTION

The special session will incorporate a number of interactive elements. First, participants will be asked to complete an “impossible puzzle,” a brain-teaser puzzler that is very challenging for most individuals to figure out, particularly under severe time constraints. The puzzles will be printed on cardstock. Participants will work individually or in groups of two on the puzzle. Prior to working on the puzzle, participants will receive a message that may prime

them to pursue the puzzle according to either growth versus fixed mindset. For example, participants may receive the notice such as, “Research has shown that most engineers have innate skills that allow them to succeed at puzzles such as these and can solve them easily with little to no practice,” a message which could promote a fixed mindset. Alternatively, participants may receive a message intended to prompt a growth mindset, such as one that says, “Research has shown that being an engineer has no impact on solving puzzles such as these. Rather, the amount of effort a person takes is more likely to predict whether a person can solve the puzzle.” A variety of messages will be crafted to demonstrate various ways the fixed versus growth mindset can be prompted. After a very restricted time period to work on the puzzle, participants will come together as a group to discuss how the message impacted their effort and mindset towards working on the puzzle.

Following the large group discussion of the puzzle challenge and its relation to classic and contemporary research relating to growth and fixed mindset, the workshop organizers will ask the participants to engage in a role play activity. Various hypothetical vignettes, printed on cardstock, will be provided to the participants. These vignettes, drawn from real classroom situations, will describe students with a particular mindset (growth or fixed) and describe instructors with a particular instructional strategy. One example of a vignette will concern a student attending office hours to get help on a particular problem. A participant designated to be the student will be asked to pretend to have a particular set of beliefs about his or her ability in the subject. A participant designated to be the instructor will be asked to role play strategies that might ignite a fixed mindset. After the initial role play exercise, participants will then be asked to come up with ideas on how the “instructor” could change strategies to promote a growth mindset.

After the role play activity, participants will come back together as a large group to discuss the role play exercise and whether or not similar situations have occurred in their own classrooms. Additionally, the participants will be asked to generate ideas on how to handle a situation where it is clear that a student is approaching a task with a fixed mindset. The workshop will conclude with a reflective activity in which the participants are asked to identify their own instructional strategies, areas where they feel they need improvement, and identify changes they would like to make.

IV. SESSION AGENDA

(0:00-0:05) Introduction and Overview

(0:05-0:10) Puzzle challenge

(0:10-0:30) Large group discussion of puzzle challenge and how the messages received impacted effort and performance; Discussion of literature on growth vs. fixed mindset

(0:30-0:50) Role play activity

(0:50-1:10) Large group discussion about role play exercise; Idea generation activity about how instructors may promote growth or fixed mindset in other examples

(1:10-1:20) Reflection activity

V. JUSTIFICATION OF NOVELTY

The interactive elements of this session will create a novel experience for our participants. Participants will directly experience the impact of implied fixed or growth mindset promotion through the impossible puzzle activity. Participants will have time to reflect on their current practices and brainstorm specific strategies for moving forward. This will be a very practice-oriented session where participants will walk away with concrete strategies they can use when interacting with their students.

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