Resources for Higher Education Faculty: Development of The Growth Mindset Curriculum for College Instructors

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RESOURCES FOR HIGHER EDUCATION FACULTY:

DEVELOPMENT OF

THE GROWTH MINDSET CURRICULUM FOR COLLEGE INSTRUCTORS

By Angela Gwathney

Submitted in Partial Fulfillment of the Requirements for the Degree of

Doctor of Philosophy

May 2021
This is to certify that the thesis presented to us by Angela Gwathney on the 26th day of April, 2021, in partial fulfillment of the requirements for the degree of Doctor of Psychology, has been examined and is acceptable in both scholarship and literary quality.
ACKNOWLEDGEMENTS

I would like to thank Virginia Salzer Ph.D, my mentor and dissertation chair for her support. My study would not have been possible without Dr.Salzer’s guidance. I can’t thank Dr.Salzer enough for her patience, time, and support. There were many times I didn’t have faith in myself or my ability; however, with Dr.Salzer’s consistent encouragement, I completed my dissertation.

I also extend my deepest gratitude to my fiance, sister, and parents for their support. This year was the most challenging year by far for me. My sister entered into the Education Psychology Ph.D. program with me and has been a consistent pillar of support for me throughout the program. My fiance, comparably, assisted me greatly in making my course work feasible and being an active partner within my life. My parents offered support in constantly reminding me that I am capable of completing my dissertation.

I would also like to acknowledge Jessica Kendorski, Ph.D. and Samuel Friedman, PsyD., in their support and dedication to the completion of this research study.
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ABSTRACT

Student’s implicit theories of intelligence within higher education influences their academic performance. A two-part study was conducted to assess educator’s implicit theory of intelligence within high academia. Participants in Study 1 included instructors within higher education institutions who have been administered a Google survey inquiring about their teaching pedagogies, personal characteristics, and demographic. Results indicated that faculty, in general, hold a growth mindset about their students but also hold some fixed mindset beliefs. In addition, there were few differences between instructors from Community Colleges vs Four-Year Institutions or between Public vs Private Institutions. These results suggest that students are no less likely to be exposed to instructors who have a growth mindset if they attend Community Colleges or Public Institutions than if they attend Four-Year or Private schools. Study 2 sought to provide educators with a growth mindset intervention. A growth curriculum was developed, providing educators within higher academia the opportunity to educate their students on Carole Dweck’s concept of implicit theories of intelligence. The curriculum was developed and forwarded to instructors within higher education. Feedback was gathered from faculty who reviewed the curriculum. Of those surveyed, the vast majority reported that they would utilize the curriculum. Adjustments were made to the curriculum in response to feedback from the reviewers. These results suggest that college faculty members generally have a growth mindset but may also have some fixed mindset beliefs. This may make them more open to utilizing an intervention geared toward promoting growth mindsets in their students, such as the one developed here.
CHAPTER 1: INTRODUCTION

Introduction

Fostering and promoting cognitive development within an educational setting has been studied in the United States as early as the late 1800s when G. Stanley Hall (who was the first person to earn Ph.D. degree in psychology in America) gave a series of lectures on education at Harvard University and used questionnaires from a study of Boston schools to write two significant papers: one dealing with children’s lies (1882) and the other with the contents of children’s minds (1883). Since this time, there have been many different beliefs regarding people’s cognitive abilities and how to foster student’s intellectual growth through education. Furthering student’s academic development within the classroom is paramount to ensure students are making adequate progress toward long-term success and this applies not only to primary and secondary education (K – 12) but also to higher education (college and beyond). As a result, it is important that educators reflect on educational processes and the benefits that it can provide within an academic setting. Researchers and educators have developed, tested, and implemented a variety of theories and interventions in an attempt to ensure that all students reach their potential. However, these have tended to focus exclusively on the content of what is being taught as well as the specifics of the teaching strategies (Good, Aronson, & Inzlicht, 2003) while neglecting the role of social-emotional contributions such as self-efficacy and motivation in the learning process. This is particularly evident in higher education settings where curriculum development is the central concern, often to the exclusion of other important factors in maximizing learning and academic
development. Focusing only on what material is being taught in college classrooms is insufficient if true educational reform is to occur (Good et al., 2003).

**Statement of Problem and Purpose of the Study**

As college administrators attempt to improve the teaching and learning environment in higher education, a greater focus on non-cognitive factors such as students’ behaviors, beliefs, mindsets, and social-emotional skills are essential for success. These non-cognitive factors, so named because they are not the typical intellectual skills taught in classrooms (Yeager, Paunesku, Walton, & Dweck, 2013), may be just as influential, if not more influential to a student’s academic performance (Good et al., 2003). Recent research suggests that among these, mindset may have the most direct effect on academic performance (Farruggia et al., 2018). Two issues, however, arise when examining the mindset of college students: most of the research is conducted on K-12 students, and, most of the research excludes the contribution of college faculty’s mindset in this dynamic process. The current study, therefore, is designed to address this gap in the literature. First, college faculty were surveyed about their beliefs concerning students’ intellectual growth potential and second, a curriculum was developed to support higher education instructors as they foster growth mindsets in their students.

**Implicit Theories of Intelligence**

An example of a non-cognitive factor includes a person’s implicit theory of intelligence. In general, implicit theories are constructed by people and reside in individual’s minds (Sternberg, 1985), are consistent predictors of academic achievement (Good, Rattan, & Dweck, 2012), and can be predictors of work ethic as people transition
into their career paths. Carol Dweck proposed that some students believe that their intellectual ability is a fixed trait and will remain regardless of the academic work they engage in. They may seek opportunities to demonstrate their believed high level of intelligence and avoid situations where their intellectual abilities may be questioned.

Alternatively, individuals who believe that their intellectual abilities are malleable and can be improved through learning will seek challenging opportunities to further their intellectual growth. Less is known, however, about how instructors’ mindsets impact their teaching styles and the subsequent learning opportunities of their students. How educators construct meaning about themselves and their student’s cognitive abilities are influential to their pedagogical practices that ultimately affect their students.

**Higher Education and Fostering Growth Mindset**

Many studies have assessed children and adolescent’s perception of their personal cognitive abilities. In addition, interventions have been conducted to study children and adolescents’ non-cognitive factors (Blackwell et al., 2007; King, 2017; Schmidt et al., 2017; Spenner, 2017). The insight gathered from these studies have provided educators insight into the best ways to promote student self-efficacy relative to their cognitive abilities (Blackwell et al., 2007; Schmidt, Shumow, Kackar-Cam, 2017; Spenner, 2017). However, additional research needs to be conducted, specifically within higher academia. College students are of importance, as these students’ implicit theories contribute and formulate common-cultural views (Sternberg, 1985). As students transition into higher education, they experience a greater amount of academic rigor and a heightened threat of failure (Robins & Pal, 2010).
The purpose of higher education is to further educate and teach a skill set that can be utilized within the workforce; the goal being that those graduating from higher education are contributing members of society. In hopes of producing students that are highly motivated and productive, it is important that adult students have faith in their cognitive abilities. It is also important that as educators within higher education, educators reflect on their own biases to ensure that their personal non-cognitive factors do not impede or negatively impact students. In reviewing the benefits of growth mindset intervention and by implementing a growth mindset intervention among college students and staff, improvements to beliefs and motivation may lead to the promotion of intellectual growth.

**Interventions**

Interventions implemented within an educational setting work toward improving academic growth but also may address the psychology of students and educators. It is important that research examine non-cognitive factors in students, as well as educators in order to maximize the effectiveness of the intervention. By implementing psychological interventions that examine non-cognitive factors, educators can work to change and improve students' academic outcomes (Good et al., 2012). Educational reform also provides educators an opportunity to self-reflect, thinking about how their implicit beliefs regarding intelligence influence their instructional practices. In doing so, students can seize opportunities for learning within an educational environment (Dweck, Walton, Cohen, 2014). Psychological interventions may target people’s beliefs regarding their intelligence, their potential to improve their intelligence, and encourage people to think
about their place in school and society in a more helpful way (Yeager & Walton, 2011; Aguilar, Walton & Weiner, 2014).

What Will Be Addressed Within the Literature Review

The literature reviewed here defines implicit theories, the positive and negative aspects of having a growth and fixed mindset and provides insight into what shapes people’s implicit theories of intelligence. People’s implicit theory of intelligence can influence campus culture, social and educational interactions that students and faculty share, and their long-term career goals as students transition into their career paths. Having a growth mindset can positively impact students, shaping student’s mindsets, affecting their academic performance, and influencing their pursuit within a specific occupation.

In addition, this review will examine the negative and positive effects that implicit beliefs can have on educators' pedagogical practices as it relates to students, specifically within higher academia. There are benefits to staff having and receiving growth mindset intervention within higher education. Educators can positively impact their student’s implicit theories of intelligence and improve their personal pedagogical practices. From a longitudinal perspective, how a person perceives their intelligence is also indicative of their achievements later in life; whether that be from an instructional standpoint or implicated within a specific job field.

CHAPTER 2: REVIEW OF THE LITERATURE

Implicit Theories of Intelligence
Definitions of Implicit Theories

As previously mentioned, implicit theories are constructed by people or stereotypes and reside in an individual’s mind (Sternberg, 1985). Implicit theories that people hold about their personal intelligence not only influence their perception of themselves, but also their evaluations of others (Sternberg, 1985). Carol Dweck, influenced by the work of Bandura, identified two different types of “theories” that students may have about their intelligence, coining the two terms entity and incremental theories (Dweck & Yeager, 2019). The two terms are known as people’s implicit theories of intelligence. However, Dweck later changed the two terms to more user-friendly terms, now referred to as a person having a “growth mindset” or “fixed mindset” (Dweck & Yeager, 2019).

Carol Dweck believes that implicit theories are characterized by beliefs about the capacity to grow one’s intellectual abilities (Haimovitz & Dweck, 2017). Implicit theories are called “implicit” because they are rarely made explicit (Dweck & Yeager, 2019). Furthermore, implicit theories are called “theories” because they create a framework for making predictions and judge the meaning of events in one’s world (Yeager & Dweck, 2012). A person's development is influenced by the way they construct meaning about themselves (Seaton, 2018). Although a person’s implicit theory of intelligence is very influential to their perceptions of themselves and the people around them, people are often unaware of the entity or incremental theories that they hold (Dweck & Yeager, 2019). Through Dweck’s research, she shows how implicit theories of intelligence influence a person’s academic performance, social interactions with others, and pursuit of their goals. (Dweck, 2000; Dweck & Yeager, 2019).
Carol Dweck has heavily studied the way people think, feel and behave when they are faced with adversity (Mills & Mills, 2018). Despite Dweck’s more recent research endeavors, Carol Dweck initially studied learned helplessness in animals with merging work on attribution theory in humans (Weiner & Kukla, 1970; Dweck & Yeager, 2019). During the 1980’s, Dweck partnered with Bandura (1983) to examine different topics for Bandura’s thesis. In doing so, Dweck and Bandura began to look at the difference between people wishing to prove and improve their abilities (Dweck & Yeager, 2019). Dweck continued her research, working collaboratively with Bandura in examining the attribution of failure (Dweck & Yeager, 2019). However, the research that Dweck conducted with Bandura (1983), would later lead to Dweck’s research regarding non-cognitive factors that influence student’s academic performance.

Since Dweck’s initial work during the 1980’s, she shifted her focus in research, thus expanding her research examining people’s implicit beliefs. Dweck is currently the leader in growth mindset research and how mindsets affect learning (Cooley & Larson, 2018). Once Dweck established the theory of growth and fixed mindset, she then worked to develop ways to reliably assess and manipulate the theories (Dweck & Yeager, 2019). In working collaboratively with her students, as noted previously, Dweck changed the original terms “entity” and “incremental” to “mindset.” The term mindset can be defined as a set of attitudes and beliefs a person has about their abilities (Robinson, 2017). Dweck and her students utilize the term “mindset,” growth and fixed mindset, to systematically organize variables that they had previously studied, such as goals, attributions, and helplessness (Dweck & Yeager, 2019). Dweck continued her research regarding mindsets and the implications of mindsets for students seeking challenging learning tasks;
examining how students persist when they are faced with adversity. She and those who have conducted research with her have found that mindsets that people possess can guide their motivation and behavior (Dweck & Yeager, 2019). Through Carol Dweck’s research, it may be seen how student’s mindsets play different roles of cause and mediator in academic achievement (Zhang, Kuusisto, & Tirri, 2017).

**Dweck’s Theory of Achievement Motivation**

Dweck’s theory on achievement motivation directly corresponds with her theory on implicit theories of intelligence; as people with certain implicit theories of intelligence will then take on adaptive or maladaptive motivational patterns (Dweck, 1986). Motivation stems from two types of goals. One goal includes learning goals, which the person is motivated by mastery (Dweck, 1986). Adaptive patterns that align with learning goals include the person attaining or working toward challenging and valued achievement goals (Dweck, 1986). The second type of goal includes performance goals, where the person seeks to show their competence to others. These two types of goals may take on adaptive or maladaptive motivational patterns (Dweck, 1986). However, maladaptive patterns may include a person being motivated by fear of failure, helpless behavior, and limiting oneself to attain goals that are easily within reach (Dweck, 1986).

When children are presented with achievement situations they are, “afforded a choice of goals, and the one that the child preferentially adopts predicts the achievement pattern that child will display” (Dweck, 1986, p. 1041). Studies conducted within laboratory and education settings have shown that children who take on a maladaptive motivation pattern are, “seriously hampered in the acquisition and display of cognitive skills when they meet obstacles” (Dweck, 1986, p. 1041). Dweck’s theory of
achievement is important, as certain types of motivational patterns have profound effects on cognitive performance (Dweck, 1986). The research addressed later within the literature that will be reviewed, will address the different motivational patterns growth and fixed mindset thinkers take on.

The Extent to Which People Possess a Fixed or Growth Mindset

Although the two terms, “growth” and “fixed” mindset, represent two extremes, many people differ in the extent to which they believe that their intelligence is fixed versus malleable. Research suggests that forty percent of US students display a growth mindset, forty percent a fixed mindset, and twenty percent show a mix of both (Boaler, 2013). However, people find both views of intelligence plausible (Murphy & Dweck, 2010; Shively & Ryan, 2012). Some people endorse one theory more than the other; most people do not have a hundred percent fixed mindset or a hundred percent growth mindset (Blazer, 2011; Murphy & Dweck, 2010; Dweck & Yeager, 2019). In fact, students may differentiate their “mindset” based on the content they are learning (Blazer, 2011). For example, students may have a fixed view of their math abilities but have a growth mindset when completing reading tasks; believing they can improve their vocabulary or reading comprehension by regularly reading the newspaper or complex literature (Blazer, 2011). As educators, it is important that educators work toward not only reinforcing student’s strengths but also encouraging them to continue to improve areas of perceived academic weakness.
Prevalence-Demographics

In addition to the individual differences in people’s implicit theories of intelligence differentiating based on academic domains, demographics and prevalence of a mindset differentiates across regions. Costa & Faria (2018) examined several studies in pursuit to find the link between implicit theories of intelligence and students' academic achievement. Costa & Faria’s (2018) findings were interesting in that they found specific parts of the world have more prevalent implicit theories of intelligence compared to other parts of the world. For example, in Eastern continents, Costa & Farias (2018) reported a positive association between incremental beliefs and achievement. Unlike Europe, North America presented a negative correlation between entity perspectives and academic achievement (Costa & Faria, 2019). However, from a global standpoint, results showed that those with a fixed mindset regarding intelligence were more likely to have lower grades (Costa & Farias, 2018). Costa & Faria (2018) also found that compared to students who have a growth mindset, having a fixed mindset was found to be detrimental to students’ achievement (Costa & Farias, 2018). Coast & Faria’s (2018) findings show the commonalities among different areas of the world, relative to theories of intelligence. Specifically, the results show from a global perspective, how beneficial growth mindset intervention is regardless of demographic.

Growth Mindset in Students

Overview of the Theory

The term “mindset” can be defined as a set of attitudes and beliefs a person has about their abilities (Robinson, 2017). Dweck utilizes the term “mindset” to examine people having more of a malleable view of intelligence or a fixed view of intelligence
GROWTH MINDSET IN HIGHER EDUCATION

(Dweck & Yeager, 2019). Research supports having a malleable view of intelligence, as there is evidence that a person’s core belief can be altered (Seaton, 2018). Those who possess a growth mindset believe that their intellectual abilities are malleable and can be improved upon throughout adulthood (Dweck & Leggett, 1988; Robinson, 2017, Ng, 2018). Having a growth mindset can lead to constructive thoughts, feelings, and behaviors (Good et al., 2003). Research has also shown, in recent years social-psychological interventions that target students’ thoughts, feelings and beliefs in and about school have had striking effects on educational achievement over months and years (Yeager & Walton, 2011).

**Feelings Associated with a Growth Mindset**

Young adulthood, or college age students, experience a major transition period as they move from high school into higher education. It is well known that the period of young adulthood is a developmental point where psychological disorders have the potential to manifest. From a social emotional standpoint, young adults are an ideal population to evaluate (Schroder, Dawood, Yalch, Donnellan, & Moser, 2015) and receive growth mindset intervention. Studies have shown how student’s implicit theories of intelligence influence the emotions students experience in an academic setting (Cook, Wildschut, & Thomaes, 2017). Students experience a number of different emotions within an academic setting; as mindsets are associated with day-to-day experiences of competence, shame, and pride, within an educational context (Cook et al., 2017). Implicit theories of intelligence may buffer against some of the negative emotions, as previously mentioned, that people may experience (Schleider, Abel, Weisz, 2015).
Positive Feelings Associate with a Growth Mindset. However, students who have a growth mindset may experience high self-efficacy regarding their ability to cope with challenges (Schleider et al., 2015). Those who have high self-efficacy are more likely to experience positive emotions. Positive emotions may include more self-confidence and self-assurance, which can have a positive impact on academic performance (Komarraju & Nadler, 2013). This stems from growth mindset student’s acquiring their self-esteem from working hard, mastering challenging tasks (Robins & Pals, 2010), and having move intrinsic motivation (Alpay & Ireson, 2019).

Negative Feelings Associated with a Growth Mindset. Although, those who have a growth mindset still experience negative emotions. For example, when students experience failure or fall short of academic standards, students may experience shame (Cook, Wildschut, & Thomaes, 2017). However, students who have a growth mindset have been found to, “experience less intense shame and more intense pride over a two-week period” (Cook et al., 2017, p. 125). In fact, students who have a growth mindset have been found to be less likely to infer incompetence when faced with adversity (Cook et al., 2017). It is possible that having a growth mindset serves as a buffer against shame (Cook et al., 2017) and other negative emotions that students may experience within an educational environment.

Motivation

Motivational patterns directly correspond with a person’s implicit theories of intelligence. Positive feelings, like feelings of motivation, have been associated with growth mindset thinkers. In regard to manifesting feelings of motivation into taking action, growth mindset thinkers are more likely to persevere when faced with adversity,
utilize good strategies, and are receptive to instruction from others so that they can expand their cognitive abilities (Dweck & Leggett, 1988; Blackwell et al., 2007; Shively & Ryan, 2012). Their motivation is fueled by challenge and challenging tasks are best for increasing a person’s ability (Dweck, 1986). This type of behavior only reinforces and fosters student’s self-help skills. It also serves as a protective factor because students who are motivated, also work diligently and focus their attention on central academic tasks (Ommundsen et al., 2005). As a result, malleable theorists have a higher sense of control over schoolwork which may serve as a protective factor.

**Thoughts Associated with a Growth Mindset**

A person’s feelings are connected to their thoughts. Growth mindset thinkers take on positive thought patterns. They think about the value of the skill that they are learning and how they can develop their skill set (Dweck, 1986). In reflecting on challenges as an opportunity to learn and grow, they are oriented toward learning goals (Dweck, 1999; Yeager & Dweck, 2012). This type of motivation stems from the belief that intelligence is adaptable, and that effort can improve outcomes (King et al., 2012).

**Learning Goals Associated with a Growth Mindset**

Implicit theories of intelligence are also influential to the academic goals that students work toward (Dweck, 1999), as motivation influences a person’s academic goals. Having a growth mindset has been found to positively correlate with learning goals (Dweck, 1986; Burnette et al., 2013). Learning goals focus on acquiring new strategies and mastering skills or concepts (Dweck, 1999). The choice and pursuit of taking on learning goals involves a process and stems from being focused (Dweck, 1986). If students meet failure when taking on a learning goal, they do not feel as though their
failure is evaluative of their ability (Dweck, 1999). Instead they feel that their abilities are not yet developed and they are motivated to continue to work toward their goal; as learning goals prompt students to focus on the effort they put forth (Dweck, 1999). Effort includes using their abilities and working toward increasing their ability (Dweck, 1999).

Taking on learning goals when approaching academic tasks, also facilitates mastery goals. Growth mindset thinkers are oriented around mastery goals (Dupeyrat & Mariné, 2005; Schmidt et al., 2017). Research suggests that by taking on a mastery approach, there are associated academic benefits which include having deep processing strategies, effort, and performance (Dupeyrat & Mariné, 2005). In addition, a growth mindset has been found to positively correlate with expectations for success (Burnette et al., 2013) and aided students in closing achievement gaps (Blazer, 2011). These academic goals may explain why other research, Costa & Farias (2018), noted that people who have an expansive view of intelligence have higher academic performance. Growth mindset thinkers take a learning goal approach in an effort to improve or increase their ability level (Robins & Pals, 2010).

**Behavior Associated with a Growth Mindset**

This type of behavior may manifest in growth mindset theorists being more prone to seeking out challenging tasks (Mueller & Dweck, 1998), engaging in help-seeking behaviors during the semester (Shively & Ryans, 2012), and pursue long term goals (Burgoyne, Hambrick, Moser, & Brit, 2018). Due to their ability to seek out challenging tasks, they are also open to collaboration; valuing community and development (Fuesting et al., 2019). As a result, students with a growth mindset also tend to earn better grades and outperform those who have a fixed mindset (Mueller & Dweck, 1998; Blazer, 2011;
Dweck, 2014; Seaton, 2018). From a longitudinal standpoint, this may explain why those with a growth mindset are more likely to earn higher grades in the different academic cycles from middle school to college (Costa & Faria, 2018). All of the positive attributes and associated behaviors, as previously mentioned, align with a growth mindset ideology and have positive implications for the future goals and careers.

**Creativity and a Growth Mindset**

As previously noted, there are a number of positive attributions associated with having a growth mindset. Creativity has also shown to coincide with having a growth mindset among business majors. In assessing business major’s mindsets relative to creativity, Puente-Diaz & Cavazon-Arroyo (2017) found several positive results associated with those who were examined and had a growth mindset. Growth mindset was a positive predictor for creative self-efficacy (Puente-Diaz & Cavazos-Arroyo, 2017). In addition, a growth mindset positively and indirectly influenced the adoption of task-approach achievement goals (Puente-Diaz & Cavazos-Arroyo, 2017). This positive influence may be attributed to the belief that with failure and practice, when generating business ideas, there is still room for enjoyment because business students are improving their creative skill set (Puente-Diaz & Cavazos-Arroyo, 2017). The results of Puente-Diaz & Cavazos-Arroyo (2017) study show the value of understanding how mindsets influence motivation and performance outcomes among students; as students who are being educated now may one day become employees in the private sector. In gaining a better understanding of student’s mindsets, educators can work to instill growth mindsets in students; which may ultimately cause positive performance outcomes within the workforce.
Fixed Mindset in Students

In contrast to a growth mindset, those individuals with an entity theory of intelligence or fixed mindset, feel that intelligence is innate, capped and something that cannot be changed (Dweck, 1999; Haimovitz & Dweck, 2017; Spenner, 2017; Mills & Mills, 2018). Dweck coined the term “entity theory of intelligence” or fixed mindset because intelligence is portrayed as an entity that dwells within us and something that is unchanging (Dweck & Leggett, 1988). Taking on a fixed mindset can have negative implications personally and professionally because it leaves little room for growth.

Feelings Associated with a Fixed Mindset

A person’s feelings implicit theory of intelligence is influential to their feelings. Having a fixed theory of intelligence has been found to lead to the feeling of negative emotions and less life satisfactions (King, McInerney, & Watkins, 2012; King, 2017). The negative self-worth that fixed mindset theorists experience occurs because their self-worth is contingent upon the approval of others. This can perpetuate a negative cycle as fixed mindset thinkers who do not experience continuous success will cast more doubt in their ability level and may be able to prove their ability level. As a result, they’ve been found to experience distress when reflecting on academic performances even when they perform as well as their growth mindset counterparts and are less likely to feel emotions like determination and inspiration (Robins & Pals, 2010).

For example, when students with a fixed mindset are presented with performance based activities, they assess poor performance as a sign of insufficiency; and as a result they feel less self-confident and less motivated to continue their pursuit in a given task (Dweck, 1986; Mills & Mills, 2018). Over time, this may have negative implications, as
Robins & Pals (2010) found that fixed mindset thinkers generally have low self-esteem, but their low self-esteem increased over four years of college. This may be due to the negative attributes that fixed mindset thinkers assimilate with effort, adversity, and failure.

Fixed mindset thinkers experience a number of different negative emotions that include low self-esteem, being insufficient, and distress. Studies have assessed student’s implicit theories of intelligence and their overall subjective wellbeing have been assessed, specifically among students in the Philippines (King, 2017). Subjective well-being, within King’s (2017) study, was defined as life satisfaction, positive affect, and negative affect. Results suggest that compared to growth mindset students, those with a fixed mindset are at risk for lower levels of subjective well-being (King, 2017). The negative emotions that students experience within an educational setting do not inhibit students; however, their mindset regarding the negative experience and their coping mechanisms may inhibit them within an educational setting.

However, activities or tasks that are easy, low-effort, and ensure success, make students with a fixed mindset feel successful and do not threaten their self-worth (Dweck, 2000). In addition, for those fixed mindset thinkers that experience success, studies have shown that having a fixed mindset has promoted greater overconfidence (Ehrlinger, Mitchum, & Dweck, 2016). The previously mentioned research supports the fact that having a fixed mindset is influential to a student's goals, beliefs regarding effort, their attributions, and their learning strategies (Yeager & Dweck, 2012). As noted previously, it is important that students have a positive theory on intelligence, as it can affect student’s well-being and other areas of their lives (King, 2017).
Thoughts Associated with a Fixed Mindset

One’s feelings are influential to their thoughts, implicit theories contribute to people’s perceptions and how they frame their thoughts (King et al., 2012). Those with fixed implicit beliefs about their intelligence have been associated with having negative thought processes; for example, helpless coping styles and judgement (Dweck, Chiu, & Hong, 1995). Judgements may also include making extreme judgements based on limited information and making quick judgements (Levy, Stroessner, & Dweck, 1998). Quick judgements may include social stereotyping (Levy et al., 1998). Although fixed mindset thinkers assess others and make judgements, they may become defensive if they perceive their abilities as being challenged and judgements are being made to measure their ability of intelligence (Blackwell et al., 2001; Yeager & Dweck, 2012). This thought pattern may also arise when a fixed mindset thinker is presented with a challenge. When challenges arise, those with a fixed mindset experience a lack of sense of control when they are presented with a challenge because they believe that their intelligence is not under their direct control (Dweck et al., 1995; King, McInerney, & Watkins, 2012).

Relative to their own perception of themselves, judgements may include making negative self-judgement about oneself. Negative self-judgements occur within fixed mindset thinkers because fixed mindset thinkers often reflect on their ability level and how others may judge them (Dweck, 1986). Fixed mindset thinkers feel that they must “prove” their ability because they often think that if one must work hard, then one doesn’t have the ability (Dweck, 1999; Mills & Mills, 2918). When fixed mindset thinkers do succeed, they attribute their success to luck (Robins & Pals, 2010). This thought pattern can be harmful when fixed mindset thinkers experience failure, as failure only reinforces
their maladaptive thought pattern. Fixed mindset thinkers rationalize their failure by attributing their abilities to low ability (Robins & Pals, 2010).

**Performance Goals and Fixed Mindsets**

Those who have a fixed mindset are more oriented toward gaining favorable judgments from those around them. This type of thought pattern causes students to take on performance goals (Dweck, 1986). Unfortunately, performance goals can be difficult to maintain as performance goals require high confidence, as a person’s ability needs to remain high to sustain task involvement (Dweck, 1986). The information previously noted may explain why those who take on performance goals interpret failure as being indicative of their abilities, performance goals cast doubt in students (Dweck, 1986). In regard to long term implications, the doubt that students experience may cause them to avoid challenging situations as a way to protect their self-worth.

**Behavior-Avoidance.** As thoughts and feelings are connected to one another, a person’s actions are influenced by their implicit theories of intelligence. Implicit theories of intelligence may also negatively influence a person’s behavior. Avoidant behaviors are common amongst fixed mindset thinkers. Mastery avoidance, performance-based approaches (Howell & Buro, 2009), and helpless coping styles (Dweck et al., 1995) are all behaviors that positively correlate with avoidant behaviors. Alternatively, fixed mindset thinkers may not display avoidant behavior but instead give up in challenging situations (Robins & Pals, 2010).

These said avoidant behaviors serve as protective factors, as they may avoid challenging situations, situations where they could potentially fail in, and fail to persist when faced with adversity (Claro, Paunesku, & Dweck, 2016; Mills & Mills, 2018).
Avoidant behavior serves as protective factors for fixed mindset thinkers because they work to protect their self-worth when they are uncertain of their abilities (Turner, Midgley, Meyer, Gheen, Anderman, Kang, & Patrick, 2002). By avoiding a specific task or taking on performance goals, fixed mindset thinkers avoid the potential of appearing incompetent, the judgement of others, and showing they may have a lack of ability in front of others (Turner et al., 2002). However, this type of behavior causes fixed mindset thinkers to stifle their progress and the opportunity to acquire new skills.

**Procrastination.** As noted previously, avoidant and helpless coping styles are associated with negative habits that fixed mindset thinkers take on. Similar to these negative coping styles, fixed mindset thinkers are prone to engage in procrastination. Howell & Buro (2009) examined the relationship between implicit theories and procrastination; and the relationship between goal orientation and procrastination. Fixed mindset beliefs were found to positively correlate with procrastination (Howell & Buro, 2009). However, within the mind of a fixed mindset thinker, procrastination serves as a protective factor which may reflect the desire to avoid losing one's inherent ability, which in turn has been associated with elevated procrastination (Howell & Buro, 2009). The tendency to procrastinate may appear when a fixed mindset thinker is presented with high demands or under pressure. Furthermore, fixed mindset thinkers may also eat more junk food and partake in excessive spending, relative to their non-limited theory peers (Job, Walton, Bernecker, & Dweck, 2015). Howell & Buro’s (2009) findings are comparable to other studies that have been conducted (Dweck et al., 1995; Turner et al., 2002).

**Practice Tasks.** Aside from challenging tasks, practice tasks may also prompt procrastination in fixed mindset thinkers. Fixed mindset thinkers engage in
procrastination when presented with practice tasks because they undervalue practice tasks. They view innate ability as unchanging (Cury, Fonseca, Zahn, & Elliot, 2008) and they believe that practice tasks won’t improve their ability. Aside from under valuing practice tasks, worry has been found to mediate the relationship between a person’s implicit theory of intelligence and practice time (Cury et al., 2008). Avoidant behavior that fixed mindset thinkers exude when they are given a practice task not only serves as a protective-factor but may also explain why fixed mindset thinkers have lower performance (Cury et al., 2008). Practice tasks may include completing a specific assignment or studying for an upcoming test (Ommundsen et al., 2005). However, refusing to practice and review a specific skill ultimately undermines a person’s performance (Cury et al., 2008).

Consequences of Self-Handicapping and Avoidant Behavior. Helpless responses to substantially challenging situations are also common among people with fixed views (Murphy & Thomas, 2008). Such behavior is an example of self-handicapping, as students with a fixed mindset are more likely to engage in self-handicapping (Urdan & Midgley, 2001). Self-handicapping is a common strategy utilized among students to prevent a poor performance from reflecting negatively on their ability (Urdan & Midgley, 2001). However, by engaging in self-handicapping, students can undermine their own academic success in the process (Urdan & Midgley, 2001).

Research has shown that, unfortunately, students associate mistakes with having a low ability. Although, mistakes are in fact valuable, a teaching opportunity, and should be valued by students (Boaler, 2013). Mistakes provide students an opportunity to learn and grow (Boaler, 2013). Studies have found that when students reflect on making a
mistake and why they made a mistake, new synaptic connections are sparked (Boaler, 2013). These new synaptic connections that are sparked result in the brain growing (Boaler, 2013). Research also suggests, Dweck & Legette (1988), the negative response patterns, as previously noted, must ultimately hinder their attainment. Having a fixed mindset can be detrimental to student performance and their acquisition of information (Cury et al., 2008).

Collaboration for Fixed Mindset Students

The mindset students possess also influences how they collaborate with their peers. As previously noted, fixed mindset thinkers believe that they need to prove their intelligence and they are oriented around performance goals (Good et al., 2003). As a result, because those with a fixed mindset favor competence and success, they may be less inclined to work collaboratively with peers who may demonstrate comparable skills (Fuesting et al., 2019). Working collaboratively with peers inhibits fixed mindset thinkers from outperforming their peers and as a result they fail to appear more competent than their peers.

Although, those who are oriented around performance goals are in fact dependent on their peers because they measure success in reaching their goal if they outperform others (Poortvliet et al., 2014). Similarly, Alpay & Ireson (2006) reviewed several different studies that found comparable results regarding fixed mindset thinkers being resistant to engage in group work. In assessing the studies, Alpay & Ireson (2006) conducted research among college students and found that fixed mindset students were less receptive to engage in group work activities compared to growth mindset students.
who were surveyed. However, reluctance to actively engage in group work and engage with one’s peers only stifles skill development.

In addition to being reluctant to engage in group work, fixed mindset thinkers may also be unreceptive to receiving help from others (Alpay & Ireson, 2006); as receiving help from others would reinforce the notion that they do not possess the innate skill set needed to complete a given task. One study, DePasque & Tricomi (2019), examined how competence threat impacted student’s ability to learn from negative feedback as a function of intelligence mindset. DePaque & Tricome (2019) found that when participants who had a fixed mindset received feedback, they showed stronger punishment responses to negative feedback. Despite the fact that the feedback that participants were provided was intended to be beneficial, participants with a fixed mindset interpreted appraisals as punishing (DePasque & Tricome, 2019). Participants with a fixed mindset also reported that they valued mastering the learning task less (Depaque & Tricome, 2019).

DePaque & Tricome’s (2019) results support previous studies, explaining why those with a fixed mindset exude avoidant behavior and why they are unreceptive to negative feedback. Having a fixed mindset can inhibit people from expanding their ability or skill set at times. As stated before, having negative thoughts about one’s ability can lead to destructive actions and feelings (Good et al., 20013). Results of the previously mentioned research (Alpay & Ireson, 2006; Poorvliet et al., 2014; Fuesting et al., 2019) may indicate the long-term implications, as students will transition into the workforce and may struggle with colleague to colleague collaboration.
Fixed Mindsets in College Students

Looking at the consequences of possessing a fixed mindset from a long-term perspective, research suggests that holding more of a fixed or growth mindset is influential to academic performance in college. One study, Robins & Pals (2010), examined implicit self-theories of ability in college students, utilizing Dweck’s model. Robins & Pals (2010) examined how college students who possess entity and incremental mindsets respond to academic success and failure. Examiners tested the overall implicit self-theory model and the stability of implicit self-theories over time (Robins & Pals, 2010). Specifically, Robins & Pals (2010), examined normative stability from high school to the end of college and consistency of individual differences over two years of college. The results of their assessment show that whether a student's intellectual beliefs are more of a fixed or malleable intelligence; their beliefs hold important implications in the academic domain (Robins & Pals, 2010). For example, college students who possess a fixed mindset held performance goals, in hopes to prove or document their abilities (Robins & Pals, 2010). Additionally, fixed mindset theorists also attributed their success to luck and their failures to low ability levels (Robins & Pals, 2010). These results suggest how influential having a fixed mindset can be, even within a higher education setting.

The Extent to Which People Possess a Fixed or Growth Mindset

People differentiate in what type of implicit theory they possess and if they endorse more of one theory compared to the other. Research suggests that forty percent of US students display a growth mindset, forty percent a fixed mindset, and twenty percent show a mix of both (Boaler, 2013). However, people find both views of
intelligence plausible (Murphy & Dweck, 2010; Shively & Ryan, 2012). Many people differ in the extent to which they believe that their intelligence is fixed versus malleable. Some people endorse one theory more than the other; most people do not have a hundred percent fixed mindset or a hundred percent growth mindset (Blazer, 2011; Murphy & Dweck, 2010; Dweck & Yeager, 2019).

In fact, students may have different “mindsets” or beliefs about their abilities in different academic domains (Blaze, 2011). For example, students may have a fixed view of their math skills but believe they can improve their vocabulary or reading comprehension by regularly reading different complex literature (Blazer, 2011). Being cognizant of the implicit theories and biases that one possesses within a specific domain is important. In being aware of one’s strengths and weaknesses, they may work toward improving their weakness or doubts they may have in their abilities within a specific domain.

Similar to people having specific implicit theories about their abilities; there are certain regions of the world where certain implicit theories are prevalent. Demographics and prevalence of a mindset differentiates across regions. For example, Costa & Faria (2018) examined several studies in pursuit to find the link between implicit theories of intelligence and students' academic achievement. Costa & Faria’s (2018) findings were interesting in that they found different parts of the world have more prevalent views on a specific theory of intelligence. For example, in Eastern continents Costa & Farias (2018) reported a positive association between incremental beliefs and achievement. Unlike Europe, North America presented a negative correlation between entity perspectives and academic achievement (Costa & Faria, 2019).
In relation to academic implications across research reviewed and demographics, Costa & Faria’s (2019) found that students with a more expansive or dynamic view of intelligence were more likely to earn higher grades in the different academic cycles from middle school to college (Costa & Faria, 2018). Although having a fixed mindset was found to be detrimental to student achievement, as students with a fixed mindset were more likely to have lower grades compared to their growth mindset peers (Costa & Farias, 2018). Coast & Faria’s (2018) findings show the commonalities among different areas of the world, relative to theories of intelligence. Specifically, the results show from a global perspective, how beneficial having a dynamic view of intelligence can be across demographics.

The Development of Implicit Theories of Intelligence

Adults influence youth’s mindsets regarding specific domains within school. However, cultural views are also influential to the way youth and young adults formulate their implicit theories of intelligence. How people conceptualize their academic abilities is a process that develops over time and their outlook on their academic ability may differentiate by subject. People’s implicit theories of intelligence differentiate in different subjects because of the way that skills are acquired and taught within language arts and mathematics differentiate. For example, when looking at more verbal areas, when a student grasps the basic concepts within reading and writing, students do not typically encounter leaps to qualitatively problem solve different tasks (Dweck, 1986). Nor are students presented with tasks that are entirely new or unfamiliar (Dweck, 1986). However, when reflecting on math instruction, math instruction involves presenting entirely new information, concepts, and skills (Dweck, 1986). Higher mathematical
concepts like geometry, algebra, and calculus can present as more challenging for students to grasp (Dweck, 1986). These distinct differences between math and verbal concepts cause psychological distress for students and may explain why certain areas of study within higher education have prevalent fixed mindsets.

Research has shown, Gunderson et al. (2017), that development of implicit theories begins in students as young as first grade. Gunderson et al. (2017) examined a cross-section of students from first grade to college. How beliefs differ in math versus reading and writing; and whether students hold different views when considering academic success in their own grade versus success in an adult job were also examined (Gunderson et al., 2017). First and second grade students believed that success in an adult job required more fixed ability in math than reading and writing (Gunderson et al., 2017). In addition, fifth, sixth, tenth, eleventh, and college students made comparable reports as the first and second grade students (Gunderson et al., 2017). Gunderson et al. (2017) was able to identify patterns of student thinking; the social learned beliefs that children gather from adults; children also apply to adults.

As children mature, they apply the social learned beliefs to themselves and their peers (Gunderson et al., 2017). These results align with previous research noted, that implicit theories not only develop at a young age but within specific domains (Blaze, 2011). It is clear that implicit theories of intelligence that students have regarding a person’s math abilities, differ from those they have for reading and writing (Gunderson et al., 2017). This may explain why specific areas of studies within higher education have been associated with specific mindsets.
Implicit Theories of Intelligence and STEM Education

The cultural belief that people have greater math or reading abilities trickle into the academic domains of higher education. As previously noted, it is culturally acceptable to identify oneself as being a “math person” or as “not being a math person” (Lin-Siegler, Dweck, Cohen, 2016; Gunderson et al., 2017). Similarly, this type of thought pattern is also seen within certain areas of study within higher education. For example, this includes the cultural belief that people within the STEM field are “math-brained” or “non-math brained” (Aguilar et al., 2014). However, when examining other academic domains, it is uncommon in the US for someone to say they aren’t a “reading person” (Gunderson et al., 2017).

The idea that only one “belongs” in a course or discipline if a person has innate ability or the idea of people who have the ability to learn effortlessly, are the type of beliefs that reinforce fixed views of intelligence (Murphy & Thomas, 2008). The beliefs students formulate about their academic abilities affect how they conceptualize their abilities later in life. This type of thought pattern comes from experiences in early academia and from a long-term standpoint, by adulthood those within the US hold a fixed view of math abilities compared to other academic areas (Gunderson, Hamdan, Sorhagen, & D’Esterre, 2017). Cultural views are influential to specific academic domains within the workforce. Students should be driven to pursue a specific field as a result of strong interest and a sense of belonging (Good, Rattan, Dweck, 2012).

Prevalence Among STEM Programs

When reflecting on cultural norms as young adults enter college, having a fixed mindset may be more common among students learning to program, and STEM areas,
due to high numbers of potential error (Cutts, Cutts, Draper, O'Donnell, & Saffrey, 2010; Shively & Ryan, 2010). There is also a high attrition rate among STEM majors within college programs (Dai & Cromley, 2014). Physics, for example, is very math-intensive and physics is portrayed as something only certain people can do (Aguilar et al., 2014). Within physics students are prone to encountering challenging and demanding material (Aguilar et al. 2014). Similarly, within math, if students experience failure frequently when they are problem solving closed questions that have right or wrong answers, it is hard to maintain a view that high achievement is possible with effort (Boaler, 2013).

While problem solving, students may also face adversity at different stages, and as a result interpret their attempt as inability (Cutts et al., 2010). This type of adversity may discourage students with specific implicit theories of intelligence, as problems that are challenging and require a creative solution may decrease motivation among fixed mindset thinkers (Alpay & Ireson, 2006). The prevalence of fixed mindset thinkers among STEM programs is high and may be due to cultural norms. How students respond to adversity that they are faced with dictates their level of success; their mindset plays a substantial role in their reaction (Aguilar et al., 2014). Cultural norms are very influential and shape student’s mindsets regarding specific academic domains and occupations within the workforce.

Having a fixed mindset is prevalent within the STEM field and as a result, students with a fixed mindset may be at risk, associating negative attributes with their abilities. Shively & Ryan (2012), have examined college students' implicit theories of intelligence relative to their abilities to succeed in STEM areas. Shively & Ryan (2012) examined if students’ implicit theories of intelligence were predictive of their attempts to
seek help to improve their understanding of intermediate algebra. Shively & Ryan (2012) found that students possessed more of a growth mindset relative to general intelligence, compared to a growth mindset in math intelligence. These results suggest that relative to Math and those enrolled in STEM programs, that students may be at risk for having negative preconceptions regarding their Math abilities. Additionally, Shively & Ryan’s (2012) study also found that students differentiate their view of their abilities and intelligence depending upon what task they are seeking to accomplish. These findings are consistent with previous research that has been conducted (Boaler, 2013). In addition, it is important that students are motivated to put forth energy into their schoolwork, however, they must first believe in their ability. Students who are more motivated to seek help are also more likely to expand their intellectual abilities.

When reflecting on long term implications, as students enter the STEM field with fixed mindsets, they may be more at risk to discontinue their pursuit to acquire a job within the STEM field. Although there is an increasing number of students who declare STEM-related majors, post-secondary administrators are concerned that STEM programs may not be able to retain their students (Flanigan et al., 2017). There are some students who have been found to begin gateway biology courses with medium-low level fixed mindset (Dai & Cromley, 2014). Studies examining students' implicit beliefs enrolled in introductory biology and computer science classes affirm that student’s fixed mindsets increase over the course of the semester (Dai & Cromley, 2014; Flannigan et al., 2017). Dai & Cromley (2014) conducted a longitudinal study examining student's implicit theories who were enrolled in a gateway biology course. Student’s implicit theories were monitored throughout the semester and six months after students completed the course.
However, as the semester progressed students fixed mindsets regarding their biology abilities strengthened. Even six months after completing the course, Dai & Cromley (2014) found that achievement in a gateway course is also associated with a level of implicit beliefs. This affirms post-secondary administrative concerns, as student’s may not be completing STEM programs and as a result negatively impacting the STEM field.

Similarly, Flanigan et al. (2017) examined how implicit theories of intelligence change across time for students pursuing introductory computer science courses; how motivation and environmental factors impact implicit theories of intelligence, and how implicit theories of intelligence predict achievement and learning outcomes in an introductory computer science course. Over the course of the semester, student’s entity beliefs increased significantly (Flanigan et al., 2017). Additionally, student’s incremental beliefs decreased significantly over the course of the semester (Flanigan et al., 2017).

Results within Dai & Cromley (2014) & Flanigan et al. (2017) studies support the importance of gateway courses and how implicit beliefs are influential to attrition rates within the STEM field; thus, having long term implications within the workforce, specifically jobs related to the STEM domain. These findings also suggest, “that early onset and high continuity of biology knowledge and inference skills in prospective majors is crucial for persistence in STEM majors” (Dai & Cromley, 2014; p244).

**Prevalence of Fixed Mindset Among STEM Students**

Cultural norms also impact the prevalence of men or women within certain occupational domains, specifically within the STEM field. Implicit theories of intelligence differ among genders within the STEM field. Women who choose to pursue
to study or pursue a career path within the STEM field, are at risk for developing a fixed mindset. Gender differences in math, are attributed to ability to cope as opposed to skill differences (Burkley, Parker, Stermer, & Burkely, 2010). It is common for women within the math field to feel a lack of belonging. Studies have shown that, women perceive a lesser feeling of belonging when their math environments transmit either a high degree of gender stereotyping or a fixed view of math intelligence (Good et al., 2012).

Gender gaps within the math field may be attributed to fixed mindsets that women have regarding their math abilities (Burkley et al., 2009). Compared to women with a growth mindset, women who have a fixed mindset and experience failure in math tend to experience the following: less identification with math, less enjoyment of math, and less intent to pursue a math major or math career (Burkley et al, 2009). Additionally, women who do not feel a sense of belonging within math fields also receive lower course grades in math (Good et al., 2012). As stated previously, cultural norms are impactful and can influence individuals' mindsets, especially cultural norms embedded within specific occupational fields.

**Growth Mindset: Prevalence in Higher Education**

Although fixed mindset thinkers have been found to be more prevalent among STEM programs within higher education, students who have more of a growth mindset, have proven to be more successful (Alpay & Ireson, 2006). For example, engineering students who have growth mindset tendencies have been found to view creativity as broad and adaptable (Alpay & Ireson, 2006). Creativity is essential when working within the engineering field. In reflecting on STEM programs, engineering fundamentally incorporates math and science; however, engineering also requires creativity, innovation,
and design (Reid & Ferguson, 2014). Additionally, engineering students who possess more of a growth mindset have been found to be more likely to be receptive to group work and were able to recognize the benefits of group work (Alpay & Ireson, 2006). Having creativity and being open to collaborate may explain why growth mindset engineering students have proven to be more successful. Alpay & Ireson’s (2006) results have positive implications for the future, relative to potentially being more open to collaboration as students transition into the workforce and cultural norms associated with the STEM field.

Regarding gender norms among the STEM field, there are women who have a growth mindset and have experienced great success. This may be because women who believe that their math skills develop through education, also believe that they can improve their math abilities (Burkley et al., 2009). Furthermore, similar to fixed mindset thinkers, environmental factors are influential to women’s career pursuit within the STEM field. Women who perceived a malleable ability environment have been found to report a sense of belonging (Good et al., 2012). Perceiving a malleable environment may serve as a protective factor for women within the STEM field, reinforcing women’s sense of belonging despite negative stereotypes (Good et al., 2012). It is important that women feel a sense of belonging within the STEM field, as having a fixed mindset and negative environmental factors may have negative consequences on their career path (Good et al., 2012).

**Growth Mindset Interventions**
The Importance of Growth Mindset for College Students

When reflecting on how to create change in cultural norms, educational interventions that target people’s implicit theories of intelligence may be one of the initial steps. Implementing interventions among students to improve their implicit theories of intelligence can be beneficial in improving student’s performance and satisfaction (Aronson et al., 2002) that may later transition as they enter the workforce. It is important that a growth mindset be instilled in students, as research has shown it is pervasive (Aronson et al., 2002). In an effort to educate students regarding their own implicit theories of intelligence, many growth mindset interventions have been conducted. As many growth mindset interventions have sought to target younger students and adolescents, growth mindset interventions that have been implemented in higher education have proven to be equally beneficial. Many studies have shown that through intervention, a person’s growth mindset can develop at all ages (Boaler, 2013; Schmidt et al., 2017). Growth mindset interventions that have been implemented among college students, have been shown to improve student’s academic performance (Aronson, Fried, & Good, 2002; Cutts et al., 2010). Instilling a growth mindset in students has proven to be extremely beneficial to student’s cognitive, behavioral, and emotional growth (Schmidt, Shumow, & Kackar-Cam, 2017). There are many factors that contribute to a student's intellectual abilities; identifying those factors, understanding those factors, and developing interventions is important (Cury, Fonseca, Zahn, & Elliot, 2008).

Interventions for High Risk College Students

Research shows how social psychological factors are influential, specifically in intellectually demanding classrooms and with struggling students (Mills & Mills, 2018).
When reflecting on those students who may benefit from growth mindset intervention the most, those placed within remedial college courses may benefit the most (Sriram, 2014). Those placed in remedial classes are considered high-risk students (Sriram, 2014), as they may have a skewed perception of their intelligence. Their skewed perception may be due to the stigmas associated with taking remedial classes or participating in special programs (Sriram, 2014). Due to being placed within a remedial class, students may also see themselves as having low ability and feel less motivated as a result. Studies have examined participation of academically high-risk college students in an intervention, promoting growth mindset, to see if it would foster significantly higher levels of academic effort and academic achievement. Sriram (2014) found growth mindset influenced effort and behaviors. Results also show differentiation among student performance when students were encouraged to view intelligence as malleable. Those taught a malleable theory of intelligence reported implementing study skills significantly more than the students who were directly taught study skills (Sriram, 2014). Sriram’s (2014) shows that growth mindset intervention can encourage students to, “engage in the academic tasks presented to them in significantly different ways and at a level that goes beyond what typical remedial courses foster” (p.529). In implementing a growth mindset intervention among high-risk students placed in remedial courses, changing their implicit theories about their intelligence can improve their academic performance (Sriram, 2014). Improved academic performance and improved self-esteem may have positive implications for the future within employment.
**Interventions Through Peer to Peer Feedback**

To instill the growth mindset in students successfully, when students face adversity, they need to be encouraged to try new strategies and seek input from others (Dweck, 2015). The motivation to try new strategies may come from not only staff, but also from student’s peers. Outside of conventional interventions, peer to peer feedback has proven to be beneficial when instilling a growth mindset among college students (Aronson et al., 2002; Cutts et al., 2010). For example, Aronson et al. (2002) demonstrated this idea, teaching a group of college students that intelligence is malleable and that they could expand their intelligence through effort. To instill a growth mindset in high school students, Aronson et al. (2002) asked college students to write to high school students, as a pen pal, encouraging letters. College student participants wrote to their pen pal, comparing intelligence to muscles that can expand and grow (Aronson et al., 2002). By the end of the semester, the results of the study showed that compared to the participants in the control group, students in the treatment group had higher grades and reported enjoying and valuing school more (Aronson et al., 2002). Aronson et al. (2002) shows how beneficial growth mindset can be and how interventions can effectively be implemented among peers.

**Remote Interventions**

Remote interventions have also proven to be beneficial to improving student’s implicit theories of intelligence and time efficiency. Yeager et al. (2019) examined the effects of a short online growth mindset intervention in a nationally representative sample of high schools in the US. Yeager et al. (2019) and his colleagues sought to improve grades among lower achieving students. The intervention was able to help lower-
achieving students improve their grades and advance mathematics courses had overall increased enrollment within the national sample (Yeager et al., 2019). The results of the Yeager et al. (2019) study show that growth mindset intervention can be implemented efficiently; in a way where teachers require no training and intervention can still redirect critical academic outcomes. Growth mindset interventions can be implemented and create positive change remotely and in a financially efficient way.

It is important, for future research, that potential constraints are considered when implementing a growth mindset intervention; one of which may include financial limitations (Bostwick & Becker-Blease, 2018). Many educational interventions can become costly, with the need to train staff prior to carrying out the intervention. Due to certain financial restraints, some schools may be reluctant to materialize such interventions. However, “are often brief and low-cost relative to other reforms” (Yeager et al., 2013, p14).

**Student’s Perception of Their Professor**

Outside of interventions implemented within an academic setting, it is important to consider the social dynamics of the classroom. Educator’s play a vital role when implementing an intervention and the way that students perceive their instructor is influential to the information they acquire. Student’s perceptions of their professor can play a role in influencing a student's implicit theories of intelligence. Educators within a classroom take on a leadership role and are influential to their students, as students may be looked upon as a professor’s followers (Yermack & Forsyth, 2016). As a result, students may perceive their professor as a powerful person. The perception of a powerful person is also influential to the implicit theories of intelligence that people possess.
(Fuesting, Diekman, Boucher, Murphy, Manson, & Safer, 2019). As leaders, professors have the ability to define and enforce rules, distribute rewards and punishments, set goals, provide feedback; and the ability to mold and shape the behaviors of their students (Yermack & Forsyth, 2016; Fuesting et al., 2019). Perceivers are said to be those, “rely on cognitive schemes that organize their perceptual processes and conclusions” (Yermack & Forsyth, 2016, P177).

**What Contributes to Initial Perception**

There are a number of social dynamics that contribute to a student’s initial perception of their professor. For example, prior to entering a classroom, students have preconceptions or schemas about people in specific categories (Yermack & Forsyth, 2016). A professor's appearance, behavior, and speech can influence inferences student’s make when initially meeting their professor (Yermack & Forsyth, 2016). Once a perceiver or student recognizes their professor, they reflect on their previous schema and consider the fit between the person and the qualities they have grown to expect in people who belong to that social group (Yermack & Forsyth, 2016). If a professor has comparable qualities of the student’s schema, then the student is more likely to remember these qualities and may overlook, or even forget characteristics that are inconsistent with the professor schema (Yermack & Forsyth, 2016). However, if the student’s schemas about the previous unknown person alter, they then prepare themselves to absorb incoming information (Yermack & Forsyth, 2016). It is important that social dynamics amongst students and educators be examined to ensure educators are creating an ideal learning environment.
Accuracy of Initial Perception

Students formulate their own perceptions and opinions of educators upon initial interactions shared. Although perceptions of a person may not be data drive, students have been found to have accurate perceptions of their instructor’s beliefs. Research, Gutshall (2016), found that 59.33% of students were accurate in their perception of their teacher’s mindset. However, despite initial interactions that a student and their professor may share, students' implicit theories of their professor have been found to change over the course of the semester (Yermack & Forsyth, 2016). When Yermack & Forsyth (2016) questioned students, undergraduate students reported that they perceived all professors to be intelligent; however, they perceived effective professors to be easier to understand and more approachable. Students also associated effective professors as being more helpful and more relatable (Yermack & Forsyth, 2016). It is important that educators reflect on the feedback provided by students and previous studies to expand their pedagogical practices and improve the way they engage with their students.

Change Over Time

As noted previously, student’s mindsets are influenced and impacted by their teacher’s mindsets (Gutshall, 2016). However, the impact of teachers' mindsets on students is mediated by student’s perceptions of their teacher’s mindset and the campus culture (Fuesting et al., 2019; Gutshall, 2016). The mindset that professors convey through their instruction and classroom environment is influential to student’s academic performance and social interactions with their peers. For example, students who’ve perceived their professor as having a fixed mindset about ability anticipated experiencing and actually experience greater vulnerability during their STEM classes (Muenks,
Canning, LaCosse, Green, Zirkel, Garcia, & Murphy, 2020). Vulnerability included lesser feeling of belonging, greater evaluative concerns, and greater distress (Muenks et al., 2020).

However, students within a STEM program who perceived STEM faculty to endorse more of a growth mindset felt more comfortable pursuing STEM majors and they believed their institution afforded more goals (Fuesting et al., 2019). Relative to instructional practices, it was found that students who perceived that their instructors focused on learning and understanding the material as opposed to performance goals, it was influential in students having a positive outcome (Fuesting et al., 2019). Students also displayed more helping behaviors in their classes and as a result, STEM student’s perceptions predicted their interest in pursuing STEM as a major (Fuesting et al., 2019). Fuesting’s et al. (2019) research shows how influential faculty mindsets are to their students. Students’ implicit theories relative to the perception of their professors is important as perceiving a sense of belonging offers another way in which mastery goals can be supported (Walker & Greene, 2009).

Overall, students who perceive that they are supported by their teacher may be more open to receiving content and less likely to feel defensive or exude deterrent behavior (Turner et. al., 2002). However, students who perceive that they aren’t supported by their teacher may take on avoidant strategies (Turner et. al., 2002). It is important that educators are mindful about the way they communicate with students and present themselves, as classroom time is filled with opportunities to send messages to students (Smith et al., 2018). Instructors who have a growth mindset can positively
influence their student’s sense of belonging, identification, and interest in the STEM field (Fuesting et al., 2019).

**Shared Relationships with Students’ Perceptions**

Student’s perception of their professor is also important, as it dictates the type of relationship they share with their professor and if they feel comfortable asking their professor for help. As students move through their semester, instructional support they need from their professor changes (Yermack & Forsyth, 2016). In the beginning of the semester, student’s perceptions of their professor may encompass thoughts of skill communication, instructional qualification, and knowledge of subject matter. However, as the semester moves on, students may seek support, instructional guidance, and more relational qualities (Yermack & Forsyth, 2016). Despite the fact that educators may not be able to control for student’s initial perceptions or implicit perceptions of their professor, they can control how they work toward changing student’s implicit theories of professors within a positive way. When professors convey a growth mindset through their instructional practices, students are more likely to seek their assistance and share a better relationship with university staff.

**Educators Implicit Theories of Intelligence**

**Importance of Educators' Implicit Theories**

It is important to examine a teacher's implicit theories of intelligence, as teacher’s mindsets are mediators and play causal roles in students' academic achievement (Zhang et al., 2017). Educators are also influential to their students beyond their content knowledge and academic readiness (Patrick & Joshi, 2019). Relative to research, there is less research that exists, examining the relationship between teacher’s mindsets and
student achievement (Zhang et al., 2017). However, studies have shown that implicit theories of faculty members predict student achievement and motivation, beyond any other faculty characteristic, including their gender, race, ethnicity, or tenure status (Canning, Muenks, Green, & Murphy, 2019). In addition, student’s development of critical thinking strategies is also said to be influenced by the mindset an educator possesses, as it may support and foster growth in their students to develop their critical thinking strategies (Seaton, 2018). Furthermore, it is important to examine how teachers’ beliefs about teaching and learning influence their instructional practices and students’ goals in the classroom (Deemer, 2004). By educators being better informed about their beliefs about teaching and how their beliefs influence their teaching practices, they can create learning environments where their students thrive (Deemer, 2004).

**Instructional methods**

Teachers can convey through their pedagogical practices if they feel that a student is going to be successful within a course or when provided a given task (Turner at el., 2002). Instructional methods that educators utilize within the classroom are impactful to students feeling supported and how they perceive their instructor. There are a number of ways that teachers can make students feel a lack of support within the classroom. For example, teachers who promote competition within their classroom may be more likely to have students who value performance goals (Walker & Greene, 2009). Competition may promote high achievement on evaluations that are given within the classroom (Church, Elliot, & Gable, 2010). Perceived stringency or harshness of evaluations have been found to predict students adopting performance-avoidance goals (Church et al., 2001). In addition, teachers who do not utilize scaffolded instructional methods, may have students
who feel less supported; as non-scaffolded instruction doesn’t assist students in learning (Turner et al., 2002). Students may also feel less supported because non-scaffolded instruction focuses on directing, assessing, and includes language that is more evaluative (Turner et al., 2002); which also supports performance-based goals within the classroom as opposed to mastery (Turner et al., 2002). Setting or reinforcing performance goals and non-scaffolded instruction are teaching methods that convey a lack of support to students.

In contrast, studies have also shown that classrooms that students perceived as emphasizing learning, understanding, effort, and enjoyment had students who displayed less avoidant behavior (Turner et al., 2002). This type of environmental setting is more likely to promote mastery-oriented behavior from students. Teachers who utilize scaffolded instruction, may have students who feel more successful. Providing students scaffolded instruction is also valuable when creating a growth mindset environment within classrooms. Scaffolded instruction enables students to find and feel mastery with a specific aspect of concept, prior to moving on to a more challenging skill. Fostering understanding and personal mastery in students, students are more likely to adopt mastery goals within the classroom (Walker & Greene, 2009).

**Language Use by Instructors**

How educators speak to their students, can send a powerful message to students. Relative to language, Turner et al. (2002) found that teachers communicated their beliefs in the way they spoke to their students. Turner et al. (2002) found that low student avoidance and high mastery classrooms related to teachers who utilized instructional discourse that aided students within the classroom cognitively and motivationally. By providing students praise, educators show that they support their students. In showing
support to students (Turner et al., 2002), students have a better understanding of the content they are learning (Rau, 2016). Thus, “how adults talk to students can change their mindsets and increase their academic tenacity” (Yermack et al., 2016, p6).

Aside from direct discourse, there are many opportunities within the classroom where teachers may send their students messages and influence their intelligence (Smith, Brumskill, Johnson, & Zimmer, 2018). Teachers may communicate their implicit opinion regarding intelligence through the comments they make and the directions they provide (Smith et al., 2018). General introductory comments and feedback that teachers provide have been found to have comparable effects on students' mindsets (Smith et al., 2018). The feedback that teachers provide students may arise from questions that students pose (Aguilar et al., 2014) or opinions that they may share. Although general comments have been found to have little effect on belief about school performance, ability, and quiz scores; it has had a large effect on implicit theories of intelligence (Smith et al., 2018). Additionally, Smith et al. (2018) found that manipulating the instructors’ comments to reflect a fixed or growth mindset had a large effect on students’ implicit theories of intelligence (Smith et al., 2018). The way in which instructors communicate with their students is significant, important, and contributes to the way in which students view their intelligence (Smith et al., 2018).

What Influences Educator’s Mindsets

Social factors that influence teacher’s mindsets have been variable across studies (Rissanen, Kuusisto, Hanhimaki, & Tirri, 2018). Social factors may include societal norms, as previously noted before, but also culture within a school building. Some studies have found that despite a teacher being socialized into the educational system that heavily
valued growth mindset practices among educators, teachers may still not have a dominant growth mindset (Rissanen et al., 2018). However, other studies have shown that sample studies conducted among a sample of classroom teachers that examined the ratio of fixed versus growth mindset found that the teachers shared characteristics within the general population (Gutshall, 2013). Gutshall (2013) measured a sample of teachers within higher education who were presented with hypothetical student scenarios (Gutshall, 2013).

Teachers' beliefs regarding the student’s mindset of ability for four hypothetical students' scenarios (mindset for scenarios) were measured” (Gutshall, 2013). Research suggests, social factors among educators may or may not be influential to their implicit beliefs or pedagogical practices (Gutshall, 2013; Rissanen et al., 2018).

Fixed Mindset in Instructors

Instructors Preconceptions

Studies have been conducted and show that people’s social perceptions are not based on principally evidence (i.e. what people look like, how they act, or what they say) (Yermack & Forsyth, 2016). Rather, perceivers’ inferences are shaped, often significantly, by their preconceptions pertaining to people in general and to groups or categories of particular people (Yermack & Forsyth, 2016). Similarly, fixed mindset instructors are more likely to make inferences about a student or judge their abilities based on minimal information. These types of preconceptions can negatively impact educator’s instructional practices and student’s academic performance. For example, instructors who have a fixed mindset do not believe that all of their students have strong innate intellectual abilities; but instead feel that some students have innate intellectual abilities and some do not (Canning et al., 2019). These types of preconceived perceptions
or assumptions may inhibit students who are viewed by their professor as having a low ability. It is possible that the student who is perceived as being low achieving is not provided with materials that present as challenging. Educators with a fixed mindset are also more likely to seek reasons for student’s success and failure due to their own fixed qualities (Rissanen et al., 2018). This presents a problem, as faculty who hold negative preconceived notions of their students, may inadvertently hinder students within the classroom.

**Instructional Practice-Motivating Students**

Case studies have been performed, showing how educators who have a fixed mindset may affect their students. A case study was done, examining one teacher within Finland who worked within an educational system that favored growth mindset pedagogy (Rissanen et al., 2018). Despite the teacher being socialized into the educational system she worked within, she didn’t have a dominant growth mindset (Rissanen et al., 2018). The case study revealed that there were differences between the teacher studied and those who were growth mindset teachers (Rissanen et al., 2018). The teacher who had more of a fixed mindset, did not persist when instructing some of her students and didn’t actively counter when her students exhibited fixed mindset behaviors (Rissanen et al., 2018). This aligns with having a fixed mindset, as many people with a fixed mindset struggle with staying motivated. The teacher who possessed a fixed pedagogy to teaching also was reliant on success motivating her students and shielding them from challenges (Rissanen et al., 2018). This may serve as a risk factor, as students who have a fixed mindset teacher may not receive adequate praise or feel motivated. It is important that educators
help their students persist when faced with academic adversity and teach their students how to interpret failure (Rissanen et al., 2018).

Teachers can convey through their pedagogical practices if they feel that a student is going to be successful within a course or when provided a given task (Turner et al., 2002). Pedagogical practices can include the expectations that they set within their classroom; and the amount of instructional support teachers offer students, which in turn may have positive or negative implications for student learning (Gutshall, 2016). Scaffolded instruction, for example, can influence students feeling supported. Those who do not scaffold instruction may be more likely to direct, assess, and utilize language that is more evaluative (Turner et al., 2002). As a result, teachers who do not scaffold instruction may have students who feel less supported and their students may be more likely to take on performance-based goals within the classroom as opposed to mastery (Turner et al., 2002).

**Performance Goals**

An overemphasis on performance goals have been associated with fixed mindset teachers. However, overemphasized performance goals shape student behavior. Performance goals cause students to measure their ability based on their performance (Dweck, 1999). However, students who take on performance goals and fail fall into helpless response patterns (Dweck, 1999). Helpless response patterns come about because they feel they are a failure and do not value those who put forth effort into their abilities (Dweck, 1999). Teachers who promote performance goals are also more likely to have students who are less likely to take on learning goals and engage in learning
opportunities that involve risk or show student error (Dweck, 1999). An overemphasis of performance goals can negatively impact students.

**Treatment**

Fixed mindset thinkers are prone to drawing conclusions about people based on a limited amount of information. Research suggests, Lee (1996), entity teachers have been found to be biased. As a result, their skewed view of their student’s ability influences the way they treat their students. It is possible that fixed mindset teachers may be more selective in their provision of feedback, encouragement, and help they provide students. Teachers with a fixed mindset are likely to treat high ability and low ability differently. Treatment for a student who is perceived to have low ability might include less feedback and providing less learning opportunities (Vermote, Aelterman, Beyers, Aper, Buysschaert, & Vansteenkiste, 2020). When students who are perceived as having low ability face adversity or experiences failure, a fixed mindset teacher may also leave their students to their own device (Vermote et al., 2020). However, treatment for high ability students may include providing more guidance and assistance (Vermote et al., 2020).

**Tailoring Instruction**

Fixed mindset educators are likely to assume that some students have innate intellectual abilities and some do not (Canning et al., 2019). Instructionally, those who view their students as having low ability may tailor their goals and teaching content to the student's ability level (Rissanen et al., 2018). However, tailoring instruction in such a way does not challenge the student nor does it help the student to expand their abilities. Custom tailoring goals and teaching content may include a fixed mindset teacher grouping their students based upon ability and creating more of a more self-fulfilling
prophecy, relative to student achievement (Dweck, 2014). This type of action can stifle student’s progress, as they aren’t working collaboratively with students who have higher ability. Students who are always grouped based on their ability may not be rigorously challenged. It’s important that educators support their students and promote growth amongst all of their students. Studies have shown that educators within higher education need to utilize more supportive approaches (Vermote et al., 2020).

**Recommendations**

Having a fixed mindset may also influence the recommendations that professors provide students. Within a higher education setting, educators with a fixed mindset may be inclined to make academic recommendations that are discouraging to their students. Professors who hold a fixed mindset may be more inclined to view underperforming students as having low ability and encourage them to drop the course (Canning et al., 2019). Encouraging students to drop the course not only threatens student’s self-efficacy, but also reinforces a fixed mindset among their students. Holding these negative views can negatively impact students' academic performance, as students who underperformed are not held to the same standard as their higher performing peers.

**Educators Interactions with Students**

Aside from teacher’s preconceptions and instructional practices, having a fixed mindset also influences the social interactions that educators share with their students. Both content and social dynamics are of equal importance (Aguilar et al., 2014). Fixed mindset instructors have been found to use more demanding and domineering approaches within their classroom (Vermote et al., 2020). Students who present as challenging or have trouble learning, appear as a threat to educators who hold fixed mindset beliefs.
When fixed mindset educators experience resistance from their students or notice that a student is not progressing, they may abandon the student (Vermote et al., 2020). Lack of progress may be attributed to students who are having trouble grasping concepts and thus threaten the self-concept of fixed mindset teachers “being a good teacher”. Instead of taking ownership, teachers who hold a fixed mindset are more likely to blame the student and the student’s lack of ability (Dweck, 2014). This concept also applies to students who present as behavioral issues or those students who struggle with motivation (Dweck, 2014). It is important that educators' mindsets are examined to ensure that their instructional practices are not negatively impacting students within the classroom.

**Environmental factors**

Teacher’s mindsets influence their instructional practice (Patrick & Joshi, 2019), which includes the learning environment they create for their students. Evidence within psychology suggests that a student’s desire to pursue a specific area of study can be unpredictable and can be influenced by environmental factors (Good, Rattan, & Dweck, 2012). Research suggests, Lee (1996), entity teachers have been found to create a negative environment within their classroom. Negative learning environments that fixed mindset educators may create, may include discourse practices that promote cognitive aspects like “final answers” and not adequately build understanding amongst students (Turner et al., 2002; 103). Professors who provide their students harsh evaluation has been associated with student's perception of a harsh classroom environment, the adoptions of performance-avoidance goals, and inhibited students from adopting mastery goals (Church et al., 2001). This type of behavior is typically found within high-
avoidance/low-mastery environments (Turner et al., 2002) which are typically associated with fixed mindset thinking.

**Expanding Abilities**

Educators have an opportunity to expand their skills set and improve the way they facilitate growth within their students. One way in which educators may expand their abilities includes their collaboration with their colleagues. However, having a fixed mindset can inhibit colleague collaboration. Relative to expanding their abilities, fixed mindset educators may be fearful to ask their colleagues for help (Dweck, 2014). Fear may be due to viewing teaching as a “lone enterprise” and viewing talent as being innate (Dweck, 2014). Dweck (2014) conveys the thoughts that fixed mindset teachers have when she says that fixed mindset teachers defined being a good teacher as someone who has a perfect lesson, free of mistakes. This thought process is what may inhibit fixed mindset educators from collaborating with their peers, as they believe asking for help or feedback may show weakness. As a result, teachers with a fixed mindset may be less inclined to collaborate with their colleagues and find it embarrassing to ask for help from others (Dweck, 2014).

**Professional Development**

Aside from colleague collaboration, those who have a fixed mindset are also less likely to engage in practice activities and place themselves in situations where their abilities might be challenged. Similarly, college professor’s implicit theory of intelligence has been found to be a predictive factor in their interest in engaging in professional development (Thadani, Dewar, & Breland, 2010). Educators' implicit theories of intelligence have been said to influence college professor’s willingness to engage in
learning opportunities and the types of learning opportunities they choose (Thadani et al., 2010). Intelligence, exercise skill, and teaching skills appear to influence college professors' choices in a variety of learning contexts (Thadani et al., 2010). College professors who have a fixed mindset have been found to be less interested in professional development, as evidence has shown that when questioned, fixed mindset educators expressed less overall interest in professional development (Thadani et al., 2010, p.126). Professional development that involved high scrutiny of instructors’ own teaching practices, fixed mindset thinkers were also avoidant of (Thadani et al., 2010). It is important that college professors are receptive to engage in professional development, even if it may expose them to scrutiny. Constructive criticism can be beneficial, as it promotes growth and can improve college professors' pedagogical practices.

**Effects of Fixed Mindset Professors**

As previously noted, certain implicit theories of intelligence are prevalent among certain fields of study. This may be due to cultural norms and student’s implicit theories, but it may also be influenced by the implicit theories of intelligence that faculty hold. Canning et al. (2019) and his colleagues examined how faculty influence student achievement. Specifically, Canning et al. (2019) examined STEM college professors’ mindset beliefs and if faculty’s beliefs were associated with underrepresented racial/ethnic minorities students’ motivation and their academic achievement in their STEM course. Racial achievement gaps in courses taught by STEM professors who endorsed a fixed mindset were found to be twice as large as those in courses taught by their growth mindset colleagues (Canning et al., 2019). Relative to student performance, students value the beliefs of the professor teaching the course more than the average
faculty beliefs within a STEM discipline (Canning et al., 2019). However, those who had fixed mindset professors reported feeling that their professors used less motivating pedagogical practices, experienced lower course performance, especially underrepresented racial/ethnic minority students (Canning et al., 2019). Canning et al. (2019) findings show that STEM college professors can influence student motivation and achievement, especially underrepresented racial/ethnic minorities students. It is important to examine implicit biases that faculty hold so that interventions may be targeted; thus, improving the field and aiding students who are at risk.

Educators' implicit theories of intelligence influence their instructional practices; thus ultimately affecting student achievement. Comparable to Canning et al. (2019) and her colleagues, Rattan, Good, & Dweck (2011) examined people who have a more fixed versus malleable mindset and how it impedes students within the classroom. Rattan et al. (2011), replicated the relationship between fixed and unproductive pedagogical practices. Two samples were taken of both college students imagining themselves as teachers and actual graduate students tasked with teaching an introductory course in their department (Rattan et al., 2011). Rattan et al. (2011) found several findings, one of which showed having more of an entity theory led people to comfort students for their presumed low ability in the subject. Due to people's assumptions of a student's low level of ability, they were more inclined to engage in pedagogical practices that could reduce engagement with the subject, as compared with participants who had a more malleable theory or intelligence. For example, those who held a more fixed mindset engaged in comfort oriented feedback; as a result, students were more likely to view their professors as being less engaged, students were less motivated, and set lower expectations for themselves
Implicit beliefs that professors or teachers hold, such as those previously noted, can have negative consequences for students. Students may feel less inclined to pursue a specific field further if those that they receive guidance from suggest they will be unsuccessful. It is important that instructors are mindful of their theories regarding intelligence.

**Prevalence-Within Certain Fields**

As noted previously, specific mindsets are prevalent amongst specific fields of study. Fixed mindsets have been found to be prevalent amidst students within the STEM field. Similarly, many college professors within the STEM field have also been found to have a fixed mindset. Endorsement of a fixed mindset has been found not to differ by gender, age, tenure statues, or faculty experience (Canning et al., 2019). In addition, amongst the STEM faculty sampled within research, fixed mindset beliefs have been found to be endorsed across thirteen STEM disciplines (Canning et al., 2019). Studies show, Canning et al. (2019), show the effects of having a fixed mindset may be found across departments, colleges, and are likely at other universities (Canning et al., 2019). This may have important implications for students who are in pursuit of studying within the STEM fields.

**At-Risk Populations**

Students enrolled within STEM programs or related fields are at risk to drop-out. Results of previous research conducted, Dai & Cromley (2014) and Flannigan et al. (2017) reinforce the importance of instructors, particularly within the STEM field, to reinforce growth mindset (Flanigan et al., 2017). To decrease student drop out amongst STEM programs, students must hold a high level of incremental beliefs but also maintain
a high level of incremental beliefs throughout the course of the semester (Dai & Cromley, 2014). It may be beneficial for educators to emphasize effort to combat fixed mindsets amongst students (Flanigan et al., 2017). Instructors may also do this through teaching, “students to view feedback and grades as an evaluation of previous performance, an opportunity to put more effort into learning, and the beginning of improving achievement, rather than a conclusion about intelligence or ability in the STEM fields” (Dai & Cromley, 2014, p245).

**Growth Mindset in Instructors**

There is a stark contrast between teaching pedagogies among educators who hold a growth mindset comparable to educators who possess a fixed mindset. Studies have found that, Rissanen et al. (2018), growth mindset educators possess the ability to influence students studying-learning processes and have the power to develop their student’s moral character. This may be due to the way that growth mindset instructors foster students thinking. Growth mindset educators' value the input that their students provide and as a result are more open to student input, communicate their expectations more clearly, and provide more motivation and encouragement to their students (Vermote et al., 2020). Much of the instruction that growth mindset educators provide to their students come from a place of support. This explains why growth mindset instructors have been found to not only support their students but also foster individual learning processes and process-focused thinking in their students (Rissanen et al., 2018). By promoting intellectual development to their students through learning and ensuring their students truly grasp concepts (Turner et al., 2020), growth mindset educators promote academic growth amongst their students.
Performance Feedback and Language Use

Communication and collaboration are important contributing factors to cognitive development and successful growth mindset intervention (Rau, 2016). Comments that teachers make, whether it be relative to an academic task or an introductory comment, affects student’s implicit theories of intelligence (Smith et al., 2018). Teachers may communicate their implicit views about intelligence through performance feedback; thus, influencing student’s mindsets (Cutts et al., 2010; Smith et al., 2018). For example, growth mindset interventions have been conducted to examine how teacher feedback impacts student performance (Cutts et al., 2010). Cutts et al. (2010) implemented a growth mindset intervention where students were taught about, what a mindset is and how mindsets influence a person’s behavior and the brain, providing them with a general schema for approaching their studies. Cutts et al. (2010) found that teaching growth mindset, paired with formative feedback and help sheets, did change students’ mindsets. Formative feedback, encouraging learning goals, and help sheets can encourage student’s self-efficacy (Cutts et al., 2010). Cutts et al. (2010) findings align with other research that has been conducted, Rau (2016), showing that the language that teachers utilize within the classroom has been found to influence student’s language, reaction to challenging situations, mastery of skills, and student’s mindset development (Rau, 2016).

Through the expectations set, feedback and direction that teachers provide; teachers can shape academic goals that students take on (Smith et al., 2018). It’s important that educators provide feedback that encourages students to take on mastery-oriented goals. By teachers improving how they speak to their students, through a growth mindset intervention, students become more focused on the content of their work (Rau,
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2016). Additionally, the language that teachers use can positively or negatively influence student’s behavior. Educators can foster motivation in their students through praising the process as opposed to the person, when providing students feedback (Jonsson & Beach, 2012). As students receive feedback, it is important that students are reminded of their potential and their ability to overcome learning hurdles (Cutts et al., 2010).

**Educators Interactions with Students**

Communication and collaboration are important contributing factors to cognitive development and successful growth mindset intervention learning (Rau, 2016). Relative to language, Turner et al. (2002) found that teachers communicated their beliefs in the way they spoke to their students. Turner et al. (2002) found that low student avoidance and high mastery classrooms related to teachers who engaged in certain instructional discourse. Instructional discourse patterns that supported students cognitively and motivationally were also characteristics of classrooms who had students that displayed low avoidance and high mastery (Turner et al., 2002). By providing students praise, educators show that they support their students. In showing support to students (Turner et al., 2002), students have a better understanding of the content they are learning (Rau, 2016). Studies have also shown, Yermack et al., (2016), that how adults speak to students, they have the ability to change their mindsets and increase student’s academic tenacity.

**Treatment**

Teachers with a malleable view have been found to treat their students fairly, assess what their student’s need to be more successful within the classroom, and set appropriate goals for their students (Lee, 1996). Studies, Vermote et al., 20202, have also
found that autonomously motivated teachers also align course materials with student’s interests, try to communicate their expectations more clearly, and provide more help and encouragement. The support that growth mindset instructors provide their students stems from the autonomous motivation, as motivation has been found to be a predictor of a need-supportive approach and motivation to motivate students (Vermote et al., 2020). It is clear that educator’s implicit theory of intelligence is influential to the way they treat their students; however, negative pedagogical practices can have negative long-term implications for some students.

**Growth Mindset Motivation**

Relative to instructional practices, research has shown that growth mindset educators have a number of positive pedagogical practices relative to the way they instruct their students. Having a growth mindset has been predictive of taking on a guided and clarifying approach in teaching methods (Vermote et al., 2020). Persistence (Rissanen et al., 2018) and autonomous motivation has been found to be common characteristics of teachers who have a growth mindset. Studies have been conducted that examine educators within higher education’s implicit theories of intelligence and how their theories can be predictors of teacher’s reliance on motivating or demotivating approaches. Having a growth mindset and autonomous motivation predicted higher education teachers providing supportive approaches to their students (Vermote et al., 2020). Educators can foster motivation in their students through praising the process as opposed to the person, when providing students feedback (Jonsson & Beach, 2012). This may explain why motivation among growth mindset educators also allows for psychological availability and for maximum support to students (Vermote et al., 2020).
Motivation is a key characteristic among growth mindset educators as those who are motivated have been found to invest more in their teaching preparation because they are motivated to align course material with students’ interests (Vermote et al., 200). In addition, teachers who are motivated actually serve as a buffer against giving up on students (Vermote et al., 2020). By teachers improving how they speak to their students, through a growth mindset intervention, students become more focused on the content of their work (Rau, 2016).

The Social-Emotional Classroom Environment for Growth Mindset

It is beneficial for educators to create a positive learning environment as it can positively influence student’s social emotional wellbeing. Social environment support and teacher support are two positive predictors of positive emotions that students may experience within an academic setting (King, McInerney, & Watkins, 2012). Teachers who have a growth mindset are also more likely to understand that a student's psychological processes, contextual factors, promote mastery orientation, and learning strategies that influence student’s learning process and can create barriers to motivation and learning (Rissanen et al., 2018). Educators who have a growth mindset truly value their students and believe that they can learn something from each student (Dweck, 2014). Due to valuing their students, compared to their fixed mindset peers, they may be less likely to make stereotypical judgements about student talents or moral character (Rissanen et al., 2018). This type of learning environment that growth mindset teachers create may explain why mastery goals have been found to positively correlate with a growth mindset. Research, Turner et al. (2002), has also shown that perceptions of a mastery goal structure in a classroom can negatively predict poor habits within students,
like handicapping. Creating a growth mindset environment may serve as a protective factor for students, as they may be less likely to engage in negative academic habits.

**Students Who Have a Growth Mindset Teacher**

As noted previously, different implicit theories of intelligence can influence or be the antecedent of various academic emotions (King, McInerney, & Watkins, 2012). Growth mindset educators are more likely to be in tune with their students social and emotional needs and influence them in a positive way. Students who are recipients of educator's growth mindset instructional practices have reported feeling they were praised for showing courage, utilizing strategies, and putting forth effort (Rissanen et al., 2018). Feeling courageous and motivated are positive emotions and it is important that educators elicit positive emotions from their students, as it is influential to the content they retain.

**Professional Development for Teachers with a Growth Mindset**

Growth mindset instructors not only create a positive learning environment for their students, but they are motivated to expand their personal skill set. Growth mindset educators are proactive because they value learning as opposed to perfection or their reputation (Dweck, 2014). To perfect their craft, they directly confront problems in their teaching (Dweck, 2014). Confronting problems head on may include being reflective of teaching practices or working with a challenging student. Growth mindset educators view struggling students in a positive light. Struggling students are looked at as opportunities to better understand their students (Dweck, 2014). Perfecting their craft may also include increasing the guidance they provide students, adjusting their teaching style to a student’s needs and preferences when they are presented with challenges (Vermote et al., 2020).
To better themselves, teachers who have a growth mindset also attend and engage in professional development to acquire additional techniques (Dweck, 2014). Professional development may also include a growth mindset teacher observing other teachers to learn and ask for feedback from their colleagues (Dweck, 2014). In taking a proactive approach, growth mindset instructors provide themselves the opportunity to grow as professionals and ultimately better service their students.

**Conclusion**

**Why Examining Growth Mindset in College Student is Beneficial**

A person’s learning process is shaped by the way a person perceives their intelligence (King, 2017). A person’s personal mindset and mindset development is an important part of their cognitive development. As the research reviewed shows, the idea of possessing a fixed or growth mindset, have infiltrated the psychological and educational field and have gained popularity (Spenner, 2017). Growth mindset interventions have successfully been implemented within a primary, middle, and high school setting. However, minimal research has been conducted within a higher education setting.

The literature reviewed shows how the growth mindset can be successfully utilized through intervention. College students are an ideal population to implement growth mindset intervention, as intervention can provide educators insight into how individuals approach achievement situations (Robins & Pals, 2002), which has long term
implications. Examining students within a college environment also provides an ideal environment for examining implicit self-theories, as achievement within higher education can have important implications for self-worth and the attainment of long-term life goals (Robins & Pals, 2002). It is important for students within higher education to receive a growth mindset intervention because without intervention, students are more susceptible to develop a lack of confidence in their intellectual abilities. This can result in poor learning experience for the student (Cooley & Larson, 2018).

**Implementing Growth Mindset Interventions with Educators**

The articles reviewed also touched on educators and the importance of educators possessing a growth mindset. Teachers who have an opportunity to receive growth mindset intervention create an opportunity to develop a more nuanced understanding of these sensemaking processes (Patrick & Joshi, 2019). Educators have an opportunity to have a more nuanced understanding because instilling a growth mindset into educators requires them to self-reflect. Self-reflection includes deeply re-examining their implicit beliefs about their identity as teachers and their ideas about learning that motivate their instructional practices (Patrick & Joshi, 2019). With teachers being better informed about their own implicit biases, they can better support student’s individual processes (Rissanen et al., 2018). Furthermore, there is minimal research examining teachers' mindsets and their pedagogical practices in the classroom; despite the fact that teachers continuously shape their students (Rissanen et al., 2018). However, it is important that educators receive growth mindset intervention. Educators have an opportunity to convey to their students that understanding, intellectual development, and improvement is what drives academic growth (Turner et al., 2002). How teachers conceptualize initiatives involving a
non-cognitive approach, may have a more significant effect on interventions (Patrick & Joshi, 2019). Additionally, growth mindset intervention provides the basis for a rigorous and validated curriculum that can help teachers embody growth mindset ideologies and communicate with their students (Dweck & Yeager, 2019). It is important that not only students but those educating students possess a growth mindset.

The Importance of Growth Mindset for Both Students and Educators

From a higher academia standpoint, the ultimate goal of higher education is to transition one’s skill set acquired from higher education and implement said skill set into a profession. As noted in the research that has been reviewed, a person’s implicit theory of intelligence can influence several different facets of their life. The mindset that a person possesses can be predictive of their academic, cognitive, motivational, affective, and socio-economic status (Zhang et al., 2017); as a growth mindset fosters motivation and learning in students as well as educators (Dweck, 2015; Patrick & Joshi, 2019). Examining implicit theories also offers educators and students a better understanding of the potential emotional consequences of adopting certain implicit theories that are experienced in academic settings (King, McInerney, & Watkins, 2012). From a long-term perspective, it is important for students and educators to understand how mindsets influence motivational and performance outcomes, as students will one day likely become employees in the private sector (Puente-Diaz & Cavazos-Arroyo, 2017).

As research continues to be conducted within the education field, it is important that growth mindset interventions are made easily adaptable to a variety of universities while still producing meaningful and significant effects (Bostwick & Blease, 2018). When discussing implementation of a growth mindset intervention, university freshman
in general education classrooms may be most ideal to utilize. Students within these classroom settings may be more likely to meet the academic challenge (Bostwick & Blease, 2018). In addition, the same said students, typically, are in the midst of transitioning at a pivotal time in the transition; from high school to college (Bostwick & Blease, 2018).
CHAPTER 3: METHOD

Study 1: Faculty Survey

Overview

Study 1 was designed to assess college instructors’ beliefs about concepts related to having a growth versus fixed mindset as well as why some students are more likely to succeed than their peers. In addition to better understanding the beliefs about instructors in higher education, this initial inquiry was designed to examine where beliefs differ as a function of the type of institution they are teaching in (i.e., community college vs four-year institutions, and private vs public school) and years of teaching experience. This study was descriptive in nature and therefore no predetermined hypotheses were developed.

Participants

Participants for this study included college instructors who have their work email publically available. Institutions were randomly selected if they posted their instructors’ email addresses on their webpages. In addition, an effort was made to include a variety of colleges including community colleges, four-year institutions, and both public and private schools. A list of colleges selected is provided in the Appendix A. Approximately, 5013 emails were sent and a total of 367 surveys were completed. A copy of the survey is provided in the Appendix B.

Demographic Description of Participants

Table 1 shows the number of faculty members who identified as a male, female, or preferred not to respond. The survey divided the gender of faculty into three categories; male, female, and other. The option “other” was provided to those who
preferred not to respond. For this study, 223 faculty members identified as female, 138 identified as male, and 6 indicated “other.”

Table 1

Gender of Faculty

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>223</td>
</tr>
<tr>
<td>Male</td>
<td>138</td>
</tr>
<tr>
<td>Other, Prefer Not to Respond, or Missing</td>
<td>6</td>
</tr>
<tr>
<td>TOTAL</td>
<td>367</td>
</tr>
</tbody>
</table>

Table 2 shows the race of participants. The survey divided the race of faculty into the following categories; American or Alaska Native, Asian, Black or African American, Middle Eastern, White, Other, Missing. Faculty members identified themselves as the following: 2 American or Alaska Native, 11 faculty Asian, 29 Black or African American, 5 Middle Eastern, White 296, Other 15, and 9 Missing. A significant amount of faculty, 82%, identified as White.
Table 3 shows the ethnicity of faculty members surveyed. The survey divided the ethnicity of faculty into three categories: Hispanic, Non-Hispanic, and Other or Missing. Relative to this study, 12 faculty members identified as Hispanic, 348 identified as Non-Hispanic, and 7 indicated “Other/Missing.” A significant finding, 93% of respondents were White.
### Table 4

<table>
<thead>
<tr>
<th>Type of Institution Where Faculty Teach</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic</td>
<td>12</td>
</tr>
<tr>
<td>Non-Hispanic</td>
<td>348</td>
</tr>
<tr>
<td>Other or Missing</td>
<td>7</td>
</tr>
<tr>
<td>TOTAL</td>
<td>367</td>
</tr>
</tbody>
</table>

**Environmental Context of Participants**

Table 4 shows the type of institution where faculty teach. The survey divided institutions into three categories: Community College, Four-Year Institutions, and Other or Missing. Relative to this study, 114 survey participants work within community colleges, 243 survey participants work in four-year institutions, and 10 survey participants indicated “Other/Missing.”
Table 5 shows the type of institution where faculty teach. The survey divided institutions into four categories: Public, Private Non-Religious, Religious Affiliated, Other or Missing. Relative to this study, 218 survey participants work within public institutions, 65 survey participants work in private: non religious institutions, 82 work within private: religiously affiliated institutions, and 2 survey participants indicated “Other/Missing.”

Table 5
Type of Institution Where Faculty Teach

<table>
<thead>
<tr>
<th>Type of Institution</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community College</td>
<td>114</td>
</tr>
<tr>
<td>Four-Year Institution</td>
<td>243</td>
</tr>
<tr>
<td>Other or Missing</td>
<td>10</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>367</strong></td>
</tr>
</tbody>
</table>
Table 6 shows the years of teaching experience of faculty surveyed. The survey divided years of experience into six categories: 0-5 years, 5-10 years, 11-15 years, 16-20 years, more than 20 years, and Other or Missing. Of those surveyed, 48 have 0-5 years of experience, 57 have 5-10 years of experience, 67 participants have 11-15 years of experience. 48 participants have 16-20 years of experience, 146 have more than 20 years of experience, and 1 indicated “Other/Missing.”

Table 6

Years of Teaching Experience

<table>
<thead>
<tr>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Experience</td>
</tr>
<tr>
<td>--------------------</td>
</tr>
<tr>
<td>0 - 5 Years</td>
</tr>
<tr>
<td>5 - 10 Years</td>
</tr>
<tr>
<td>11 - 15 Years</td>
</tr>
<tr>
<td>16 - 20 Years</td>
</tr>
<tr>
<td>More Than 20 Years</td>
</tr>
<tr>
<td>Other or Missing</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
</tr>
</tbody>
</table>

**Measures**

A Google Form survey was forwarded to instructors who have their work email publicly available. The survey consisted of four groups of questions regarding their beliefs about the causes of students' success or lack of success. In addition, the survey included a series of demographic questions about the type of institutions faculty work within, their work experience, the type of students they teach, and their personal characteristics. A copy of the survey and the introductory email is provided in the Appendix B.

**Procedures**

After securing permission from PCOM’s IRB, publically available email addresses from college instructors were collated. The Google Form survey (see Appendix B) was sent. The unidentified responses were recorded on the Google Form page and in a Google Sheet. Frequencies were summarized and are presented in Chapter Four.
Study 2: Faculty Training Modules

Overview

As noted previously, there are a number of benefits to students taking on a growth mindset. Students who have a growth mindset outperform their peers, are more motivated, and have higher self-esteem (Mueller & Dweck, 1998; Blazer, 2011; Dweck, 2014; Seaton, 2018). While a number of interventions exist for K - 12 students, little work has been done with higher education learners. Therefore, the purpose of Study 2 was to develop a curriculum that promotes and encourages students to take on a growth mindset. This curriculum is process-focused, as the purpose is for the learner to increase their growth mindset over time. The development of this curriculum, similar to previous work in this area (Aronson et al., 2002; Good et al., 2003; Blackwell et al., 2007), sought to implement a growth mindset intervention, but now for students in higher education settings.

The development of the curriculum was based on Jean Piaget’s theory that cognitive development. According to this theory, learning occurs when, attempting to acquire new information, the learner fits new information into existing cognitive schema until the information becomes too incongruent and modifications are needed to the existing schema to fully represent the new information. People’s acquisition of knowledge is based on schemas. Schemas are knowledge structures that link, “related concepts used to make sense of the world and to make predictions” (Spillane et al., 2002). Schemas also assist students in processing new information (spillane et al., 2002) and students utilize existing schemas to acquire new information. Based on these cognitive processes, the Introduction to Growth Mindset Curriculum was formulated. In addition,
each module is designed to be very brief in order to increase efficiency and to avoid interference with instructional time.

**Procedures**

Study 2 involved the development of the Growth Mindset Curriculum for College Instructors to use with their students in higher educational settings. After its development, it was reviewed by five colleagues; reviewer 1 was G.G., reviewer 2 N.C., reviewer 3 Y.H., reviewer 4 T.R., and reviewer 5 K.A. The curriculum includes an introduction video that provides instructors an overview of the curriculum and how it should be implemented. Additional details regarding the outline of the curriculum, lessons, discussion questions, and assessments are also included within the curriculum. Feedback was discussed and revisions to the curriculum were made. These are described in Chapter 4.

**Curriculum Outline**

The curriculum includes an introductory video (see Appendix C) that lasts approximately twelve minutes and is intended to provide information for college instructors about growth mindset and its benefits in higher education. The introduction video also informs instructors how the curriculum should be implemented. Prior to implementing the curriculum and after completing the curriculum, instructors administer a pre- and post screener to assess student beliefs about the malleability of intelligence. These screeners are utilized to help faculty gauge student change over time (Dweck, Chiu, & Hong, 1995).

The pre- and post-screeners include the following: three items in the implicit theory of intelligence measure (a) "You have a certain amount of intelligence and you
really can't do much to change it"; (b) "Your intelligence is something about you that you can't change very much"; and (c) "You can learn new things, but you can't really change your basic intelligence (Dweck, Chiu, Hong, 1995)." Students indicate their agreement with each of these statements on a 6-point scale from 1 (strongly agree) to 6 (strongly disagree). Teachers score their student’s responses by averaging the scores on the three items to form an overall implicit theory score (ranging from 1 to 6). Students who score a 3 or below are classified as being “entity” or fixed mindset theorists. Students who score a 4 or above are classified as being “incremental” or growth mindset theorists (Dweck, Chiu, & Hong, 1995). In previous work by Dweck and colleagues, this method leads to about 15% of the participants not being classified as either growth or fixed mindset (i.e., they score between 3.0 and 4.0) with the remaining 85% being evenly distributed between the two implicit theory groups (Dweck, Chiu, Hong, 1995, p.260). This shorter scale may also lend itself to professors in being time efficient in collecting data and additional insight.

The curriculum includes eight brief, animated lessons intended to be introduced during class time throughout the learning term. The initial lesson reviews the history of implicit theories of intelligence. The second and third lessons take a deeper look at the meaning of the term “implicit theories of intelligence and review how the term was coined. The fourth and fifth lessons address the feelings associated with implicit theories of intelligence. The sixth lesson touches on the thoughts that are associated with implicit theories of intelligence. The seventh lesson touches on the behaviors associated with implicit theories of intelligence. The eighth lesson, the last lesson, touches on implicit theories of intelligence and education.
Each lesson concludes with a reference page and a brief synopsis of what students have recently learned and what they will learn within the next lesson. Discussion questions are offered to instructors within the curriculum if they choose to generate open discussion regarding the recently presented material. Once instructors have exposed students to all eight lessons, they are to provide students the post-assessment screener. After administering the assessment, instructors can compare and contrast student’s pre-and post assessment results. After being exposed to the curriculum, students will ideally demonstrate an increase in their growth mindset.
CHAPTER 4: RESULTS

Study 1

Overview

Study 1 assessed college instructor’s beliefs about why some students are more likely to succeed than their peers. In addition to better understanding the beliefs about instructors in higher education, this inquiry examined where beliefs differ as a function of the type of institution they are teaching in, the type of student they teach, and individual characteristics of the teachers. Google Survey responses were collected, via email, from 367 higher education faculty members across the country.

Faculty Beliefs About Growth Mindset

Faculty members were provided five item asking about their beliefs about growth mindset. Table 7 reflects the percentage of faculty who “agree,” “sort of agree,” “disagree,” and “sort of disagree” with the statements presented below.
Table 7

Faculty Beliefs About Growth Mindset (percentages)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Sort of Agree</th>
<th>Sort of Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>If students work hard, they will do better in my class</td>
<td>73.5</td>
<td>25.7</td>
<td>0.3</td>
<td>0.5</td>
</tr>
<tr>
<td>If students work hard, they can become smarter</td>
<td>38.4</td>
<td>41.6</td>
<td>14.0</td>
<td>6.0</td>
</tr>
<tr>
<td>Some students in my class are smarter than others</td>
<td>57.7</td>
<td>30.1</td>
<td>8.5</td>
<td>3.8</td>
</tr>
<tr>
<td>Students who struggle in my class are probably not that capable to begin with</td>
<td>1.6</td>
<td>9.6</td>
<td>35.3</td>
<td>53.4</td>
</tr>
<tr>
<td>The smarter students in my class grasp the material faster</td>
<td>38.6</td>
<td>44.6</td>
<td>13.8</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Of those surveyed, less than one percent of participants noted that they “disagree” or “sort of disagree” with the following statement: “If students work hard, they will do better in my class.” However, about 99% of faculty “agree” and “sort of agree,” that if students work hard, they will do better in their class.” Additionally, 20% of faculty “disagree” or “sort of disagree,” that students who work hard can become smarter. However, 80% of faculty “agree” or “sort of agree,” that if students work hard, they can become smarter. A little more than 87% of faculty “agree” or “sort of agree” that some
students within their class are smarter than others. In contrast, about 12% “disagree” or “sort of disagree,” that some students within their class are smarter than others. About 11% of faculty “agree” and “sort of agree’ that students who struggle in their course are probably not that capable to begin with. However, about 88% of faculty “disagree” and “sort of disagree” that students who struggle in their course are probably not that capable to begin with. Lastly, a little more than 16% of faculty members “disagree” or “sort of agree” that, “smarter students in their class grasp the material faster.” In contrast, about 83% “agree” or “sort of agree” that “smarter students grasp the material within their course faster.

**Differences Between Community and Four-Year College Faculty**

As previously noted, faculty members surveyed were asked to disclose their beliefs regarding student success. Faculty members were provided five questions, asking about their beliefs about growth mindset. Table 8 compares faculty who teach at a four-year college vs those who teach at a community college.
Table 8

Faculty Beliefs About Growth Mindset: Community College vs Four-Year College

<table>
<thead>
<tr>
<th>Statement</th>
<th>Community College</th>
<th>Four-Year College</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>If students work hard, they will do better in my class</td>
<td>3.68 (0.54)</td>
<td>3.73 (0.47)</td>
<td>( p = .417 )</td>
</tr>
<tr>
<td>If students work hard, they can become smarter</td>
<td>3.14 (0.81)</td>
<td>3.11 (0.89)</td>
<td>( p = .733 )</td>
</tr>
<tr>
<td>Some students in my class are smarter than others</td>
<td>3.46 (0.71)</td>
<td>3.38 (0.85)</td>
<td>( p = .409 )</td>
</tr>
<tr>
<td>Students who struggle in my class are probably not that capable to begin with</td>
<td>1.71 (0.82)</td>
<td>1.54 (0.67)</td>
<td>( p = .041 )</td>
</tr>
<tr>
<td>The smarter students in my class grasp the material faster</td>
<td>3.17 (0.82)</td>
<td>3.20 (0.77)</td>
<td>( p = .477 )</td>
</tr>
</tbody>
</table>

*Note.* Larger number indicates more likely to agree with the statement.

No significant differences were found when community college faculty and four year college faculty’s growth mindset beliefs were compared regarding the following statements:

- If students work hard, they will do better in my class.
- If students work hard, they become smarter.
- Some students in my class are smarter than others.
- The smarter students in my class grasp the material faster.
A statistically significant difference was found between faculty who teach at a Community College (M = 1.71, SD = 0.82) and faculty who teach at a Four Year College (M = 1.54, SD = 0.67, $p = .041$). Note, however, the differences between these means is 0.17 on a four point scale.

**Differences Between Public and Private Institutions**

Table 9 compares faculty who work within a public institution and those that work in a private institution. A One-Way ANOVA was run to assess if there was a significant difference in faculty’s response to the questionnaire provided.
Table 9

Faculty Beliefs About Growth Mindset: Public vs Private Schools

<table>
<thead>
<tr>
<th></th>
<th>Private Institution</th>
<th>Public Institution</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>If students work hard, they will do better in my class</td>
<td>3.77 (0.52)</td>
<td>3.71 (0.48)</td>
<td>$p = .371$</td>
</tr>
<tr>
<td>If students work hard, they can become smarter</td>
<td>3.17 (0.93)</td>
<td>3.11 (0.85)</td>
<td>$p = .608$</td>
</tr>
<tr>
<td>Some students in my class are smarter than others</td>
<td>3.31 (0.82)</td>
<td>3.44 (0.79)</td>
<td>$p = .222$</td>
</tr>
<tr>
<td>Students who struggle in my class are probably not that capable to begin with</td>
<td>1.61 (0.70)</td>
<td>1.59 (0.74)</td>
<td>$p = .863$</td>
</tr>
<tr>
<td>The smarter students in my class grasp the material faster</td>
<td>3.17 (0.77)</td>
<td>3.19 (0.79)</td>
<td>$p = .877$</td>
</tr>
</tbody>
</table>

*Note.* Larger number indicates more likely to agree with the statement.

When faculty members who work within private institutions were compared to those that work in public institutions, no significant difference was found. Feedback provided from faculty members who work within private and public institutions were comparable.

**Differences Between Years of Teaching Experience**

Table 10 shows the results of a One-Way ANOVA performed, comparing faculty members views and their teaching experience. Those who have been teaching 0-10 years
were compared to those who have taught 11-20 years, and to those who have taught over 20 years.

Table 10

Faculty Beliefs About Growth Mindset: Years of Teaching Experience

<table>
<thead>
<tr>
<th></th>
<th>0 - 10 Years</th>
<th>11 - 20 Years</th>
<th>More Than 20 Years</th>
<th>Significance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>If students work hard, they will do better in my class</td>
<td>3.74 (0.46)</td>
<td>3.63 (0.54)</td>
<td>3.76 (0.47)</td>
<td>( p = .122 )</td>
</tr>
<tr>
<td>If students work hard, they can become smarter</td>
<td>3.12 (0.89)</td>
<td>3.11 (0.86)</td>
<td>3.12 (0.86)</td>
<td>( p = .995 )</td>
</tr>
<tr>
<td>Some students in my class are smarter than others</td>
<td>3.28 (0.87)</td>
<td>3.42 (0.77)</td>
<td>3.52 (0.76)</td>
<td>( p = .058 )</td>
</tr>
<tr>
<td>Students who struggle in my class are probably not that capable to begin with</td>
<td>1.44 (0.61)</td>
<td>1.50 (0.69)</td>
<td>1.77 (0.80)</td>
<td>( p &lt; .001 )</td>
</tr>
<tr>
<td>The smarter students in my class grasp the material faster</td>
<td>3.05 (0.76)</td>
<td>3.14 (0.84)</td>
<td>3.33 (0.74)</td>
<td>( p = .014 )</td>
</tr>
</tbody>
</table>

*Note.* Larger number indicates more likely to agree with the statement.

The results suggest that there is a moderate to significant positive linear trend for the following questions: “Some students in my classes are smarter than others,” “Students who struggle in my class are probably not that capable to begin with,” “and “The smarter students in my class grasp the material faster.” The previously noted questions endorse a
growth mindset. These results suggest the more experience faculty members have, teaching tends to be associated with a more fixed mindset.

**Faculty Beliefs About Why Students Succeed and Why They Do Not Succeed**

College faculty were surveyed and asked about their ideas concerning student success. For example, they were asked about whether working hard or “being smart” or “capable” was reasonable when students did well and when they did not do well in class. Questions were grouped into three categories: those that indicated that doing well (or not doing well) was related to Growth Mindset Beliefs, Fixed Mindset Beliefs, or External Causes. The questions are listed in Table 11 below.
Table 11

Faculty Beliefs About Why Students Do or Do Not Do Well in Their Class

<table>
<thead>
<tr>
<th>Growth Mindset</th>
<th>When students DO WELL in your class, it is because:</th>
<th>When students DO NOT do well in your class, it is because:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● they work hard</td>
<td>● they do not work hard</td>
</tr>
<tr>
<td></td>
<td>● they care about learning</td>
<td>● they do not care about learning</td>
</tr>
<tr>
<td></td>
<td>● they feel good when they succeed</td>
<td></td>
</tr>
<tr>
<td>Fixed Mindset</td>
<td>● they are smart</td>
<td>● they are not very capable</td>
</tr>
<tr>
<td></td>
<td>● succeeding makes them feel smart</td>
<td>● they do not think they are smart enough to succeed</td>
</tr>
<tr>
<td>External Causes</td>
<td>● the material is easy</td>
<td>● the material is too hard for them</td>
</tr>
<tr>
<td></td>
<td>● I am a good instructor</td>
<td>● my teaching needs to improve</td>
</tr>
</tbody>
</table>

**Growth Mindset Beliefs: When Students Do Well**

Three questions fall into this category: Students do well when they (1) work hard, (2) care about learning, and (3) feel good when they succeed.

1. *When student do well in your class, it is because they work hard*

Believing that student success is a result of student’s hard work, aligns most with a growth mindset. Those surveyed were asked if they believe that when students do well within their course, it is because of working hard. The results of the study suggest that 83% believed that when students do well within their course, they work hard. Similarly, 17% of respondents indicated that they, “sort of agree.” In contrast, 0% of respondents disagreed or “sort of disagreed.” The results are pictured below.

*Graph 12*
2. When students do well in your class, it is because they care about learning

Those faculty surveyed from high education institutions were asked if they endorse the idea that, when students do well in your class, it is because they care about learning. Of those surveyed, 65% stated that they “agreed” and 31% stated they “sort of agree.” Only 1% stated they “disagree” and 3% stated they “sort of disagree.” The results are pictured below.

*Graph 13*
**When students do well in your class, it is because they feel good when they succeed**

Faculty surveyed were asked if they feel when students do well within their course, if it’s attributed to students feeling good when they succeed. Of those faculty members who were surveyed, 63% “agreed” and 31% “sort of agreed.” in contrast, 0% disagree and only 6% “sort of disagree.” These findings are pictured below.

*Graph 14*

**Growth Mindset Beliefs: When Students Do NOT Do Well**

Two questions fall into this category: Students do NOT do well when they (1) do not work hard, and (2) do not care about learning.

1. **When students do not do well in your class, it is because they do not work hard.**

   Faculty were asked if they feel, “when students do not do well in their course, it is because they do not work hard.” Of the respondents, 42% of respondents feel that they “agree” with the previously mentioned statement. Similarly, 44% “sort of agree” with the previously mentioned statement. In contrast, 4% “disagree” and 44 % “sort of disagree.” The results are pictured below.

*Graph 15*
2. When students do not do well in your class, it is because they do not care about learning

Of the faculty who were surveyed, 10% “agree” and 37% “sort of agree” that students do not do well within their class because students do not care about learning. In contrast, 19% “disagree” and 34% “sort of disagree” that students do not do well within their class because students do not care about learning. The results are pictured below.

Graph 16
Fixed Mindset Beliefs: When Students Do Well

Two questions fall into this category: Students do well when (1) they are smart, and (2) succeeding makes them feel smart.

1. When students do well in your class, it is because they are smart.

Believing that student success is a result of student intellect, aligns most with a fixed mindset. Those surveyed were asked if they endorse the belief that, “when students do well in your class, it is because they are smart.” The results of the study suggest that 24% of the college faculty surveyed “agree”, when students do well within their class, it is because the student is smart. In addition, 57% of those surveyed, “sort of agree”, that when students do well in their class, it is because they are smart. In contrast, 15% of those surveyed, “sort of disagree,” that when students do well in their course, it is attributed to student intellect. An even smaller amount of those surveyed, 4%, “disagree” that when students do well within their course, it is because the student is smart. The results are pictured below.

Graph 17

2. When students do well in your class, it is because succeeding makes them feel smart
Faculty surveyed were asked if they feel when students do well within their course, if it’s because succeeding makes students feel smart. Only 1% “disagreed” and 12% “sort of disagreed.” In contrast, 44% “agreed” and 43% “sort of agree.” The results are pictured below.

**Graph 18**

### Fixed Mindset Beliefs: When Students Do NOT DO Well

Two questions fall into this category: Students do NOT do well when they (1) are not very capable, and (2) do not think they are smart enough to succeed.

1. **When students do not do well in your class, it is because they are not very capable**

   Attributing student failure to lack of ability aligns most with a fixed mindset. Those surveyed within high education institutions were asked if they endorse the belief that when students do not do well in their class, it is because the student is not very capable. The results of the study suggest that 37% disagree and 27% “sort of disagree.”
In contrast, 3% of respondents stated that they agree and 23% of survey respondents “sort of agree.” The results are pictured below.

*Graph 19*

2. When students do not do well in your class, it is because they do not think they are smart enough to succeed

Faculty surveyed were asked if they feel students who do not do well within their course can be attributed to student’s not thinking they are smart enough. The results show that 10% “agree” and 46% “sort of agree.” Additionally, 12% disagreed and 32% “sort of disagreed.” The results are pictured below.

*Graph 20*
External Causes: When Students Do Well

Two questions fall into this category: Students do well because (1) the material is easy, and (2) I am a good instructor.

1. When students do well in your class, it is because the material is easy

Those faculty surveyed from high education institutions were asked if they endorse the idea that, when students do well in your class, it is because the material is easy. Of those surveyed, 6% “agree” and 20% of faculty “sort of agree.” In contrast, 45% “sort of disagree” and 6% “disagree.” The results are pictured below.

Graph 21

2. When students do well in your class, it is because you are a good instructor
Attributing student success to being a good instructor aligns with having a growth mindset, since the instructor has faith within their students and their professional abilities. Of those surveyed, 29% of higher education faculty agree that students do well within their course because they are a good instructor. In addition, 62% “sort of agree” that students do well within their course because they are a good instructor. In contrast only 9% “sort of disagree” and 0% “disagree.” The results are pictured below.

Graph 22

External Causes: When Students Do NOT DO Well

Two questions fall into this category: Students do NOT do well because (1) the material is too hard for them, and (2) my teaching needs to improve.

1. When students do not do well in your class, it is because the material is too hard for them

Those surveyed within high education institutions were asked if they endorse the idea that; when students do not do well in your class, it is because the material is too hard for them. Of those surveyed, 42% agree and 34% of faculty “sort of agree.” In contrast, 34% “sort of disagree” and 21% disagree. The results are pictured below.
2. When students do not do well in your class, it is because my teaching needs to improve

Self-doubt is heavily associated with a fixed mindset. Of those surveyed, only 9% stated that they agree; students do not do well within their class because their teaching needs to improve. In addition, 49% of higher education faculty surveyed “sort of agree.” In contrast, 13% disagree and 29% sort of disagree. The results are pictured below.

Graph 24
Some faculty members reported that they are not able to provide individualized opportunities for their students. Of those surveyed, 42% “disagree” and 37% “sort of disagree” with the previous statement noted. However, only 4% “agree” and 17% “sort of agree.” These results suggest that many faculty members can provide their students individualized opportunities to promote academic success. These findings are presented within Graph 25 below.

**Graph 25**

*Classroom competition can improve student performance*

Lastly, 24% of respondents “disagree” and 43% “sort of disagree” that classroom competition can improve student performance. However, only 7% “agree” and 26% “sort of agree.” These results suggest that a small amount of faculty support a fixed mindset. These findings are presented within Graph 26 below.

**Graph 26**
CLASSROOM COMPETITION CAN IMPROVE STUDENT PERFORMANCE

- Agree: 7%
- Sort of agree: 26%
- Sort of disagree: 43%
- Disagree: 24%
Study 2

Overview

Study 2 involved the development of the Growth Mindset Curriculum for College Instructors to use with their students in higher educational settings. After its development, it was reviewed by five colleagues; reviewer 1 was G.G., reviewer 2 N.C., reviewer 3 Y.H., reviewer 4 T.R., and reviewer 5 K.A. The curriculum includes an introduction video that provides instructors an overview of the curriculum and it should be implemented. Feedback was discussed and revisions to the curriculum were made.

The Curriculum

The Curriculum is presented in the Appendix C and is described in Chapter 3.

Curriculum Feedback
Table 13

Faculty Beliefs About Feasibility of the curriculum (percentages)

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>Not Sure</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Do you feel this</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>curriculum is feasible</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do you feel this</td>
<td>100</td>
<td>0</td>
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<td>-</td>
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<tr>
<td>curriculum is user</td>
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<tr>
<td>friendly?</td>
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<td></td>
</tr>
<tr>
<td>Would you use this</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>curriculum in your</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>own classroom?</td>
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<td></td>
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<tr>
<td>Do you think this</td>
<td>60</td>
<td>0</td>
<td>-</td>
<td>40</td>
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<tr>
<td>curriculum could</td>
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<tr>
<td>help students take on</td>
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<td></td>
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<td></td>
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<tr>
<td>a growth mindset?</td>
<td></td>
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<tr>
<td>Do you think this</td>
<td>100</td>
<td>0</td>
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<td>-</td>
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<tr>
<td>curriculum is</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>applicable to those</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>students enrolled in</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social &amp; Behavioral</td>
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<td></td>
</tr>
<tr>
<td>Science programs?</td>
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<td></td>
</tr>
<tr>
<td>Do you feel this</td>
<td>100</td>
<td>0</td>
<td>0</td>
<td>-</td>
</tr>
<tr>
<td>curriculum will help</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>educators about their</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>own “mindsets?”</td>
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</tbody>
</table>

Overall, respondents felt the curriculum is 100% user friendly, that they would utilize the curriculum in their own classroom, it was applicable to those students enrolled in Social & Behavioral Science programs, and it would help educate students about their own “mindsets.” Respondents were asked if they thought the curriculum could help students take on a growth mindset. Of the respondents 60% said “yes” and 40% said “maybe.”
CHAPTER 5: DISCUSSION

Overview of the Outcomes

Faculty Beliefs About Growth Mindset

Of those surveyed, a majority of faculty members agreed that students do well in their class because they work hard and as a result become smarter. A majority of faculty also reported that they agree that students care about learning and as a result students do well within their course. I believe the results of Study 1 have positive implications for higher education faculty members, as it shows a majority of faculty members believe hard work aligns most with academic success and increasing intellect. These thought patterns also align most with a growth mindset, as growth mindset thinkers believe hard work and motivation contribute to success. The results of Study 1 cast hope, as faculty members who have more of a growth mindset are more likely to have students who are more academically successful.

While not assessed in this study, it is possible that faculty who believe that hard work leads to academic success, may also be receptive to implementing the curriculum formulated in Study 2. Many of the faculty members who were surveyed show that they possess strong growth mindset ideologies. As a result, they may value these qualities in their students and be more likely to utilize an intervention that can promote a growth mindset in their students. It is imperative that faculty hold a growth mindset, as it hinges on student’s academic and long term success.

Furthermore, a majority of faculty members “disagree” and “sort of disagree” that students who struggle in their course are probably not that capable to begin with. I believe this is important and has positive implications. These results may suggest that
faculty members can assess a student's academic performance objectively and recognize that academic success does not equate to a student’s ability. This also has positive implications, as successful growth mindset interventions must be implemented amongst faculty members who are open minded. These results also suggest that faculty members may be receptive to implementing a growth mindset curriculum. When implementing a growth mindset curriculum, it is important that faculty members are receptive to implementing the intervention as they must implement the curriculum with fidelity.

A majority of faculty members agreed that a student's lack of success is attributed to a lack of work ethic. I believe these results can have negative implications, as these results indicate bias. In contrast to faculty member’s beliefs, it is possible that some students do not perform well within a course because they lack guidance, fail to grasp the material, or need the material presented in an alternative way. It is important that faculty members self-reflect on their teaching pedagogies and think about whether their instructional methods create an opportune learning environment. These results reinforce the need for growth mindset intervention among students and faculty within higher education.

Over eighty percent of faculty members indicated that they have some fixed mindset beliefs, reporting they agree, some students are “smarter” than others. Similarly, over eighty percent of faculty members agreed, “smarter” students grasp the material within their course faster. The majority response to these two statements suggest that faculty members surveyed also have some fixed mindset ideologies. These results have negative implications as faculty members feel that intelligence is contingent upon performance and innate ability. Having fixed mindset ideologies, specifically
preconceptions about a student's academic ability, can negatively influence a student's academic success.

Relative to long term implications, faculty’s fixed mindset can also negatively impact a student's long term career goals. Students who perceive their instructor to have a lack of faith within their ability may deter students from pursuing more challenging courses or long-term career goals. It is important that students and faculty review the curriculum provided within Study 2, as faculty should associate hard work with academic outcome and student intellect.

The results indicate faculty member’s ability to self-reflect on the content that they provide students and their teaching abilities. A majority of faculty reported that they feel they are a good instructor. However, a large amount of faculty members reported students do not do well within their course because their teaching needs to improve. These results contradict one another and these results are concerning. The positive implications of these results suggest that faculty members are able to reflect on their teaching pedagogies. However, it is inconclusive if those surveyed feel they are strong instructors. These results also reinforce the need for faculty to receive growth mindset intervention. It’s important that faculty members who are instilling growth mindset ideologies also believe in themselves.

Overall, the results suggest that, of those surveyed, faculty members have growth mindset and fixed mindset tendencies. This research supports the need for professional development, as it is important for faculty within higher education to have a growth mindset. Faculty who have a growth mindset have been shown to share more positive relationships with their students and create a better learning environment. Relative to
long term implications, having a growth mindset can have positive effects on students and ultimately their academic performance.

**Community College vs Four-Year College**

The results of Study 1 indicate that there was no significant difference in faculty’s growth mindset when four-year institutions were compared to two-year institutions. These results present positive implications. I believe pre-existing stigmas exist, relative to the level of quality of instruction that faculty within two-year institutions compared to four-year institutions provide. I think that many people believe that the level of rigor is greater within four-year institutions, compared to two year institutions. However, the results of Study 1 have positive implications and show continuity regarding faculty's belief system between two-year institutions and four-year institutions. I believe these results are positive. Although faculty within two-year institutions and four-year institutions don’t have a high level of growth mindset ideologies; their implicit theories of intelligence are comparable. These results negate any stigmas associated with the institution’s ideologies about implicit theories of intelligence. Furthermore, the results may imply a continuity in the level of instruction within both types of institutions.

In contrast, the negative aspects include faculty members having both growth and fixed mindset beliefs. I believe that these results have educational implications and suggest the need for reform. The results found within Study 1 show that faculty members within higher education also need growth mindset interventions to shape their implicit biases regarding their pedagogical practices and educational beliefs. In providing educators growth mindset reform, it can improve faculty members instructional practices. In turn, growth mindset interventions can have positive and long term effects on students.
In faculty being provided growth mindset intervention, they are more likely to share a positive relationship with their students and provide a higher quality of instruction. Through these efforts, students may perform better academically which may ultimately lead to long term success.

**Public vs Private Institutions**

The results of Study 1 indicate when private institutions were compared to those that work in public institutions, no significant difference was found. These results present positive implications. These results suggest continuity regarding faculty's belief system within private institutions and public institutions. However, I believe these results have educational implications and suggest the need for reform. To maximize a student's academic success, it’s imperative that faculty have more of a growth mindset.

**Years of Teaching Experience**

The results Study 1 suggest that there is a moderate to significant positive linear trend for the following questions: “Some students in my classes are smarter than others,” “Students who struggle in my class are probably not that capable to begin with,” and “The smarter students in my class grasp the material faster.” The previously noted questions endorse a growth mindset. These results suggest the more experience faculty members have, teaching tends to be associated with a more fixed mindset. It’s important that faculty members who are more established within their career receive growth mindset intervention. These results also suggest that continued professional development regarding growth mindset practices within the classroom is necessary. Implementing growth mindset curriculum within higher education classrooms creates an optimal learning environment for students. Students who are exposed to growth mindset
curriculums may be more likely to take on growth mindset characteristics which result in improved academic success.

**Lack of Diversity in Higher Education Faculty**

A majority of the faculty members sampled within Study 1 are Caucasian. This is concerning, as diversity appears to lack within higher education faculty who work within the area of Social and Behavioral Sciences. There is a need for diversification amongst Social and Behavioral Sciences; especially given the diverse population that those who work within the Social and Behavioral Science field service. The first step in creating a more diverse faculty within higher education is instilling a growth mindset in people.

First and foremost, higher education calls for those who aren’t minorities but those that are qualified. However, teaching all students to believe in their abilities and pursue challenges is the first step in creating a more diverse faculty within higher education. In teaching students that they have the potential for growth, they may be more likely to pursue a rigorous occupation that they may not have previously considered. Students may also be more inclined to turn key the information they’ve learned. Sharing information is the foundation of higher education. In students recognizing their potential, they will acquire new skills; thus resulting in students pursuing challenging prospective occupations and resulting in a more diverse faculty within higher education.

**Limitations**

Relative to the pre- and post- screener that was utilized, there may be a negative aspect. One negative aspect in utilizing a small number of items within a scale may include a low internal reliability, as psychometrically, the internal reliability of a measure is positively related to the number of items in the measure (Dweck, Chiu, & Hong, 1995).
However, the scale was utilized across prior studies, the high internal reliability would suggest this is not a problem (Dweck, Chiu, & Hong, 1995).

One significant limitation of this Study 2 includes the implementation of the intervention, as it was not implemented. Implementing the intervention could have offered additional insight into the effectiveness of the curriculum. In addition, feedback could have been obtained from the faculty who implemented the curriculum.

An additional limitation of Study 2 includes the amount of feedback acquired after colleagues were asked to review the curriculum. It’s important to receive an ample amount of feedback from those implementing the curriculum. Detailed feedback can assist with tapering the curriculum and making appropriate adjustments to the curriculum.

**Future Directions**

Relative to Study 1, it should also be noted that only faculty members within the Social and Behavioral Science departments were surveyed. Future research may seek to inquire about faculty’s mindsets within other disciplines. Having a better understanding of how other faculty members within different disciplines conceptualize students’ success may be helpful when implementing the Introduction to Growth Mindset Curriculum.

Additionally, in regard to the survey in Study 1, future studies should sample a larger demographic of schools within the country. In making a point to conduct a large sample, the sample may be more likely to include a more diverse sample of faculty members. This is important, as having a representative sample of faculty members can provide examiner’s insight into the higher education institutions within the country that may benefit from intervention.
Future research should include implementation of the curriculum developed within Study 2. Implementation of the curriculum will determine the effectiveness of the curriculum. It is ideal that those students who are exposed to the curriculum will increase their growth mindset. It is also hopeful that exposure to the growth mindset curriculum will also positively influence student’s pursuit in their long term goals.

As future research is conducted and the intervention is implemented among college classrooms, it's important that examiners note what class the intervention is being implemented within. In instructors providing the examiner additional insight into the rigor and type of course they teach, examiners may be able to collect additional data. Having a better understanding of the type or course and level of rigor may influences student’s mindsets and student success.

Research conducted within the future may also seek to develop an intervention specifically for college faculty members. A holistic approach, offering interventions to high education faculty members and students may be most beneficial. In implementing an intervention amongst faculty and students, it is more likely that long term change may persist.
REFERENCES


Canning, E.A., Muenks, K., Green, D.J., Murphy, M.C. (2019). STEM faculty who believe ability is fixed have large racial achievement gaps and inspire less student motivation in their classes. *Science advances*, 5(2), 1-7.


Fuesting, M. A., Diekman, A. B., Boucher, K. L., Murphy, M. C., Manson, D. L., & Safer, B. L. (2019). Growing STEM: Perceived faculty mindset as an indicator of


APPENDICES

Appendix A: Universities Sampled

- Albright College
- Alvernia University
- Brookdale Community College
- Bergen County College
- Bloomfield College
- Caldwell University
- Cabrini University
- Cemetery University
- Chestnut Hill College
- Drexel University
- Delaware University
- East Stroudsburg University
- Elizabeth College
- Felician University
- Fairleigh Dickinson
- Franklin and Marshall College
- Georgian Court University
- Gettysburg College
- Immaculata University
- James Madison University
- John Hopkins University
- Kean University
- Monmouth University
- Muhlenberg College
- Montclair State University
- Penn State University
- Ramapo College, Rowan University
- University of Maryland
- University of Pennsylvania
- Saint Peter’s University
- Saint Joseph University
- Seton Hall, Temple University
- The College of New Jersey
- Towson University
- William Paterson University
- Wesley College.

Appendix B: College Faculty Survey
Survey Link

https://docs.google.com/forms/d/e/1FAIpQLSeregM6LfhpqPKexdUsFnKZUcRAMB7Z
hdH4IrCwuLk-78UwA/viewform?usp=sf_link

Copy of Survey

Introduction

College Faculty Survey

Hello from the Educational Psychology Program at the Philadelphia College of Osteopathic Medicine. We are surveying college faculty members about their ideas concerning student success and we would love your help. The attached survey should take less than 5 minutes to complete and all of your responses will be kept completely confidential.

If you have any questions about the survey, please feel free to contact us by replying to this email.

Thank you for your help.
Question #1

When students DO WELL in your class, it is because:

*Mark only one oval per row.*

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Sort of Agree</th>
<th>Sort of Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>They are smart.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They work hard.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>You are a good instructor.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The material is easy.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They care about learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They feel good when they succeed.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Succeeding makes them feel smart.</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Question #2

When students DO NOT well in your class, it is because:

*Mark only one oval per row.*

<table>
<thead>
<tr>
<th></th>
<th>Agree</th>
<th>Sort of Agree</th>
<th>Sort of Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>They are not very capable.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They do not work hard enough.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>My teaching needs to improve.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The material is too hard for them.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They do not care about learning.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>They do not think they are smart enough to succeed.</td>
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</tr>
</tbody>
</table>
Question #3

How much do you agree with the following statements?

*Mark only one oval per row.*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Sort of Agree</th>
<th>Sort of Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>If students work hard, they will do better in my class.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students who struggle in my class are probably not that capable to begin with.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some students in my class are smarter than others.</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If students work hard, they can become smarter.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The smarter students in my class grasp the material faster.</td>
<td></td>
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</tr>
</tbody>
</table>
**Question #4**

How much do you agree with the following statements?

*Mark only one oval per row.*

<table>
<thead>
<tr>
<th>Statement</th>
<th>Agree</th>
<th>Sort of Agree</th>
<th>Sort of Disagree</th>
<th>Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working with struggling students is frustrating.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I enjoy collaborating with colleagues.</td>
<td></td>
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</tr>
<tr>
<td>I prefer to work alone.</td>
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<tr>
<td>Classroom competition can improve student performance.</td>
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<td></td>
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<tr>
<td>I am not able to provide individualized learning opportunities for my students.</td>
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</tbody>
</table>
Demographic and Background Questions

5. I teach at a:
   
   *Mark only one oval.*

   - Community College
   - Four Year College or University
   - Other: _______________________


6. My institution is:
   
   *Mark only one oval.*

   - Public
   - Private (not religiously affiliated)
   - Private (religiously affiliated)
   - Other: _______________________


7. Before COVID-19, I taught predominately:

*Mark only one oval.*

- [ ] Online
- [ ] On Campus
- [ ] Blended
- [ ] Other: ____________________________

8. I have been teaching for:

*Mark only one oval.*

- [ ] 0 - 5 years
- [ ] 5 - 10 years
- [ ] 11 - 15 years
- [ ] 16 - 20 years
- [ ] more than 21 years

9. I teach (check all that apply)

*Check all that apply.*

- [ ] Undergraduates
- [ ] Graduate Students (e.g., MS, PhD, PsyD)
- [ ] Professional Students (e.g., MD, DO, JD)
- [ ] Other: ____________________________
10. What subjects do you teach?


11. I identify as:

Mark only one oval.

☐ Female
☐ Male
☐ Transgender Female
☐ Transgender Male
☐ Gender Variant/Non-Conforming
☐ Prefer Not to Answer
☐ Other: ________________________

12. Are you Hispanic or Latino?

Mark only one oval.

☐ Yes
☐ No
13. Which category best describes you?

*Mark only one oval.*

- [ ] American or Alaska Native
- [ ] Asian
- [ ] Black or African American
- [ ] Native Hawaiian or Other Pacific Islander
- [ ] Middle Eastern
- [ ] White
- [ ] Other: ____________________

14. Where do you teach (optional)?

________________________
Appendix C: Curriculum

Lesson One Transcription

00:08:00 Hello! This lesson is the first of several. I will briefly be defining and reviewing the meaning of implicit theories of intelligence.

00:20:00 Implicit theories of intelligence are constructed by people or stereotypes and reside in an individual’s mind. Implicit theories that people hold about their personal intelligence influence their perception of themselves and their evaluation of others.

00:37:00 Carol Dweck, influenced by the work of Albert Bandura, identified two different types of theories that students may have about their intelligence; coining the two terms, “entity” and “incremental theories.” The two terms are known as people’s implicit theories of intelligence. However, Dweck later changed the two terms to be more user friendly.

00:57:00 They are now referred to as a person having a growth mindset or a fixed mindset. Carol Dweck believes that implicit theories are characterized by beliefs about the capacity to grow one’s intellectual abilities. Implicit theories are called “implicit” because they are rarely made explicit.

01:17:00 A person’s implicit theory of intelligence is very influential to the perceptions of themselves and the people around them. However, people are often unaware of the fixed and growth mindset that they hold.

01:34:00 There are a number of different ways implicit theories of intelligence influence a person’s daily life. Through Dweck’s research, she shows us how implicit theories of intelligence influence a person’s academic performance, their social interactions, and the way in which they pursue their goals.
In conclusion, this initial lesson was intended to provide a brief overview of the term, “implicit theory of intelligence.” In the next lesson, you will be provided additional detail and insight in regard to the term and how the term came to be.

**Lesson Two Transcription**

In this lesson, you will learn more about the term “implicit theory of intelligence” and you’ll learn about how the term came to be coined. Carol Dweck has heavily studied the way people think, feel, and behave when they are faced with adversity. Despite Dweck’s more recent research endeavors, Carole Dweck initially studied learned helplessness in animals, with emerging work on Attribution Theory in humans.

During the 1980’s, Dweck partnered with Bandura to examine different topics for Bandura’s thesis. In doing so, Dweck and Bandura began to look at the difference between people wishing to prove and improve their abilities.

The research that Dweck conducted with Bandura would later lead to Dweck’s research regarding non cognitive factors that influence student’s academic performance.

Since Dweck’s initial work during the 1980’s, she shifted her focus in research; thus expanding her research in examining people’s implicit beliefs.

Dweck’s is currently the leader in growth mindset research in how mindsets affect learning. Once Dweck established the theory of “growth” and “fixed mindset,” she then worked to develop ways to reliably assess and manipulate the theories.
In working collaboratively with her students, Dweck changed the original terms, “entity” and “incremental” to “fixed” and “growth” mindset. The term mindset can be as a set of attitudes and beliefs a person has about their abilities.

Dweck and her students utilized the term mindset, “growth” and “fixed mindset,” to systematically organize variables that they had previously studied; such as goals, attributions, and helplessness.

Dweck continued her research regarding mindsets and the implication of mindsets for students seeking challenging learning tasks; examining how students persist when they are faced with adversity. She and those who have conducted research on the topic have found that mindsets that people possess can guide their motivation and behavior.

Through Carol Dweck’s research, it can be seen how student’s mindsets play different roles of cause and mediator in academic achievement.

In conclusion, this lesson was intended to provide additional insight into how the terms “fixed” and “growth” mindset came to be. In the next lesson, you’ll learn more about the meaning of each term.

Lesson Three Transcription: A Deeper Look at the Meaning

Welcome to the third lesson. Within this lesson, you’ll be taking a deeper look into the meaning of the term “growth mindset” and “fixed mindset.”

As previously noted, the term “mindset” can be defined as a set of attitudes and beliefs a person has about their abilities.

Dweck utilized the term “mindset” to examine when people had more of a malleable view of intelligence or a fixed view of intelligence.
Research supports that there is evidence that a person’s core belief can be altered. Those who possess a growth mindset believe that their intelligence or rather intellectual abilities are malleable and can be improved upon throughout adulthood.

Having a growth mindset can lead to constructive thoughts, feelings, and behaviors.

Research has shown in recent years social-psychological interventions that target student’s thoughts, feelings, and beliefs in and about school have had striking effects on educational achievement over months and years.

In contrast to a growth mindset, those individuals with an “entity” or “fixed” mindset of intelligence feel that intelligence is innate-capped, and something that can not be changed.

Dweck coined the term “entity”, or rather “fixed mindset” because intelligence is portrayed as an entity that dwells within us and something that is unchanging. Taking on a fixed mindset can have negative implications personally and professionally because it leaves little room for growth.

Within this lesson, you had the opportunity to take a deeper look into the meaning of growth and fixed mindset. Within the next lesson, you’ll take a deeper look into the feelings associated with a growth and fixed mindset.

Lesson 4 Transcription: Feeling Associated with Growth Mindset

Within the previous lesson we reviewed the terms “growth” and “fixed mindset” and how the two terms were coined. Within this lesson, we’ll be discussing the feelings associated with a growth mindset.
Young adulthood or those that are college aged students experience a major transition period as they move from high school to higher education. It is well known that the period of young adulthood is a developmental points where psychological disorders have the potential to manifest.

Studies have show how student’s implicit theories influence the emotions that students experience in an academic setting. Students experience a number of different emotions within an academic setting.

Mindsets are associated with day to day experiences of competence, shame, and pride.

However, students who have a growth mindset may experience high self-efficacy regarding their ability to cope with challenges. Those who have high self-efficacy are more likely to experience positive emotions like more self-confidence and self-assurance.

Let’s talk about negative feelings associated with growth mindset. Those who have a growth mindset still experience negative emotions. For example, when students experience failure or fall short of academic standards, students may experience shame.

However, students who have a growth mindset have been found to experience less intense shame and more intense pride over a two week period.

In fact, students who have a growth mindset have been found to be less likely to infer incompetence when faced with adversity. It is possible that having a growth mindset serves as a buffer against shame and other negative emotions that students may experience within an educational environment.
02:09:75 This concludes the lesson in reviewing the feelings associated with a growth mindset. Within the next lesson, you’ll review feelings that are associated with a fixed mindset.

**Lesson 5 Feelings Associated with a Fixed Mindset**

00:00:00 Within this lesson you will gain additional insight into the feelings associated with having a fixed mindset.

00:09:75 A person’s feelings are influential to a person's implicit theory of intelligence. Having a fixed theory of intelligence has been found to lead to the feeling of negative emotions and less life satisfaction.

00:27:00 The negative self-worth that fixed mindset theorists experience occurs because their self-worth is contingent upon the approval of others.

00:30:00 This can actually perpetuate a negative cycle. As fixed mindset thinkers who do not experience continuous success will cast more doubt in their ability level.

00:51:00 As a result, they’ve been found to experience distress when reflecting on academic performances; even when they perform as well as their growth mindset counterparts. And, they are less likely to feel emotions like determination and inspiration.

1:09:00 For example, when students with a fixed mindset are presented with performance based activities, they assess poor performance as a sign of insufficiency. As a result, they feel less confident and less motivated to continue their pursuit in a given task.

1:29:00 Over time, this may have negative implications. A study performed in 2010 found that fixed mindset thinkers generally have a low self-esteem but their low self-esteem increased over a four year period of college.
1:47:00 This may be due to the negative attributes that fixed mindset thinkers assimilate with effort, adversity, and failure. Fixed mindset thinkers experience a number of different negative emotions; that include low self-esteem, being insufficient, and distress.

02:07:00 A study performed in 2017 assessed student’s implicit theories of intelligence and their overall subjective well being; specifically amongst students within the Philippines. Subjective well-being was defined as life satisfaction, positive affect, and negative effects.

2:27:00 Results suggest that compared to growth mindset students, those with a fixed mindset are at-risk for lower levels of subjective wellbeing. The negative emotions that students experience within an educational setting do not inhibit students.

2:44:00 However, their mindset regarding the negative experience and their coping mechanisms may inhibit them in an educational setting. Tasks that are easy, low effort, and ensure success make students with a fixed mindset feel successful. It does not threaten their self-worth.

03:04:00 In addition, for those fixed mindset thinkers that experience success; studies have shown that having a growth mindset has promoted greater competence. As previously noted, it’s important that students have a positive theory on intelligence, as it can affect student’s wellbeing.

03:24:00 This concludes lesson five. Hopefully you were able to acquire additional insight into the feelings associated with having a fixed mindset. Within the next lesson, you’ll gain more information regarding the thoughts associated with a growth and fixed mindset.
Lesson 6 Thoughts Associated with Growth & Fixed Mindset

00:00:00 A person’s feelings are connected to their thoughts. Growth mindset thinkers take on a positive thought pattern. They think about the value of the skill they are learning and how they can develop their skill set.

00:22:00 In reflecting on challenges as an opportunity to learn and grow, they are oriented toward learning goals. This type of motivation stems from the belief that intelligence is adaptable and that effort can improve outcomes.

00:37:00 A person’s feelings are influential to their thoughts. Implicit theories contribute to people’s perceptions and how they frame their thoughts. Those with a fixed mindset have been found to have a negative thought process. For example, helpless coping styles and judgement.

00:57:00 When we think about judgements, judgements may include making extreme judgements based on a limited amount of information and making quicker judgments. Quick judgements may include social stereotyping.

01:12:00 Although fixed mindset thinkers assess others in making judgements, they may become defensive if they perceive their abilities as being challenged. Or if they feel judgements are being made to measure their intelligence. This thought pattern may also arise when a fixed mindset thinker is presented a challenge.

01:32:00 When challenges arise, those with a fixed mindset experience a lack of sense of control. When they are presented with a challenge because they believe that their intelligence is not under their direct control. Relative to their own perception of themselves, judgements may include making negative self-judgements about themselves.
01:52:00 Negative self judgements occur within fixed mindset thinkers because fixed mindset thinkers often reflect on their ability level and how other may judge them. They think that they must prove their ability because they often think that if one must work hard, then one doesn’t have the ability.

02:12:00 When fixed mindset thinkers experience success, they attribute their success to luck. This thought pattern can be harmful when fixed mindset thinkers experience failure; as failure only reinforces their maladaptive thought pattern. Fixed mindset thinkers rationalize their failure by attributing their abilities to being low.

02:32:00 This concludes our lesson about the thoughts associated with having a growth and fixed mindset. Within the next lesson, we will gain additional insight into the behaviors associated with having a growth and fixed mindset.

**Lesson 7 Behaviors: Fixed & Growth Mindset**

00:00:00 Within this lecture we will discuss the behaviors associated with growth and fixed mindsets.

00:08:00 Growth mindset theorists may be prone to seeking out more challenging tasks, engaging in help seeking behaviors during the semester, and pursue long-term goals.

00:19:00 Those who have a growth mindset have the ability to seek out challenging tasks. They are also open to collaboration, valuing community and development. As a result, students with a growth mindset also tend to earn better grades and outperform those who have a fixed mindset.

00:39:00 From a longitudinal standpoint, this may explain why those with a growth mindset are more likely to earn higher grades in the different academic cycles; from middle school to college.
Relative to fixed mindset thinkers, avoidant behaviors are common amongst fixed mindset thinkers. These types of behaviors might include mastery avoidance, performance based approaches, and helpless coping styles. They may also give up on challenging situations.

Avoidant behaviors serve as a protective factor, as fixed mindset thinkers may avoid challenging situations or situations where they could potentially fail in. This type of behavior protects their self-worth when fixed mindset thinkers are unsure of their abilities.

By avoiding these specific tasks or taking on performance goals, fixed mindset thinkers avoid the potential of appearing incompetent, the judgment of others, and showing they have a lack of ability in front of others. However, this type of behavior causes a fixed mindset thinker to stifle their progress and acquire a new skill.

Fixed mindset beliefs have been found to positively correlate with procrastination. The tendency to procrastinate may appear when a fixed mindset thinker is presented with high demands or when they feel as though they are under pressure.

This concludes the lesson on the behaviors associated with having a fixed and growth mindset. Within lesson eight, you will learn more about implicit theories of intelligence, as they relate to an academic setting.

**Lesson 8 Implicit Theories of Intelligence & Education**

00:00:00 within this lecture, we will discuss the implicit theories of intelligence, as they relate to education.
00:08:00 Adults influence youths mindsets regarding specific domains in school. However, cultural views are also influential to the way youth and young adults formulate their implicit theories of intelligence.

00:23:00 For example, when looking at a more verbal area, a student grasps the basic concepts within Reading and Writing; students don’t typically encounter leaps to qualitatively problem solve different tasks. Nor are students presented with tasks that are entirely new or unfamiliar.

00:43:00 How people conceptualize their academic abilities is a process that develops over time and their outlook on their academic ability may differentiate by subject. The way people acquire skills within language arts and mathematics differentiate; thus people’s outlooks also differ,

01:03:00 Research has shown that development of implicit theories begins in students as young as first grade. Researchers have also been able to identify patterns of student thinking, the social learned beliefs that children gather from adults, and children also apply to adults.

01:22:00 As children mature, they apply the social learned beliefs to themselves and their parents. These results align with previous research noting that implicit theories not only develop at a young age but within specific domains.

01:37:00 This concludes our lesson on implicit theories of intelligence as they relate to education. Hopefully you enjoyed the different lessons provided within this curriculum and gained additional insight into your own thought processes.
Curriculum Feedback

Below is the feedback that an educator provided, regarding the Introduction to Growth Mindset Curriculum:

**Reviewer 3 Y.H.:** I really enjoyed your presentation. Very thoughtful and well put together. It provided good information and kept my attention. I think the information will be useful to students as well. The only thing I found difficult to read was the reference pages. The writing blended in too much for me with the background. I don't know if I'm just old and my eyes are bad!