Supporting Self-Efficacy Through Mindset: The Impact of a Growth Mindset Innovation on the Self-Efficacy of Middle School Students in a Teen Leadership Course

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SUPPORTING SELF-EFFICACY THROUGH MINDSET: THE IMPACT OF A GROWTH MINDSET INNOVATION ON THE SELF-EFFICACY OF MIDDLE SCHOOL STUDENTS IN A TEEN LEADERSHIP COURSE

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DEDICATION

I dedicate this to my husband. The love of my life and the person that always pushed me
to be better. Also, to my three sons, I hope you have seen my efforts and know I did all of
this for you, for us and our family.
ACKNOWLEDGMENTS

I want to thank my family. I start of course with all the support my husband gave when he was here with us on earth. He always wanted me to be the best version of myself and I am so grateful for that. I also want to thank my boys, first for being so understanding with the long nights and missed games to reach the end of this lofty goal, and more importantly for being there for me always. I want to thank my mom and sister. When in my darkest moment, you were the light I needed. Thank you for every dinner, carpool, laundry pile, and all the other tasks you have taken over to ensure I accomplished this goal. I want to thank my Kojah family for always checking in from afar and cheering me on and encouraging me when I felt defeated. Also, my friends that are family, it takes a village, and I am lucky to be surrounded by the best of the best both near and far.

I want to thank my dissertation chair Dr. Grant. The support you have given me went above and beyond. Your slight nudges and pushes kept me moving forward, even if it were just a sentence, it was movement. I hope you really know how important you have been in this process.

Lastly, I want to thank my students. You all inspire me daily. I am thankful to be your teacher and hope you know the greatness you bring to this world.
ABSTRACT

Understanding how the disposition of a student interacts with or influences a behavior plays a central role in cognitive theories. Middle school years have been accounted for as being difficult, awkward, and sometimes downright stressful. The overall purpose of this action research was to examine the impact of a growth mindset innovation using a digital portfolio on the self-efficacy of middle school students in a leadership course. The research questions were: (1) How can a growth mindset intervention using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course? (2) What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention?

The participants consisted of (n = 23) middle school students in a related arts leadership semester-long course. This was a mixed methods study, collecting pretest and posttest survey responses and student interviews, journal responses, and digital portfolio activities. Two surveys were used to measure growth mindset and self-efficacy in public speaking. Quantitative data analysis showed significant growth from pre- to postsurvey measuring student growth mindset. Students showed significant growth as well from pre- to postsurvey results when measuring self-efficacy. Qualitative data were examined for belief in growth mindset and ability to accomplish a task in a leadership course. Qualitative data analysis revealed students perceived the growth mindset innovation impacted self-efficacy in public speaking as well as other areas. Specifically, four themes were identified: (a) The innovation gave students a Growth mindset, (b) Growth
Mindset gave strategies to students to support self-efficacy in multiple school and classroom areas, (c) correct methods with careless errors, and (d) Digital portfolios were designed to represent student knowledge, but students were impacted little by them. Implications for practice and future research are discussed, and limitations are identified.

*Keywords:* Self-Efficacy, Growth Mindset, Leadership, Middle School, Digital Portfolio
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CHAPTER 1

INTRODUCTION

National Context

It takes a lot of determination and confidence to stand up in front of your peers and speak about a topic, even more so at the middle school age level. As a student moves from an elementary school to a middle school, they are faced with challenges such as peer influence, larger class sizes, multiple teachers, changing and moving between classes, puberty, and locker rooms. During middle school years many students show a decline in grades, a decrease in intrinsic motivation, and an increase in negative attitudes about school (Romero et al., 2014). When students become overwhelmed, they tend to shut down, specifically when success has been easy for them and without much effort (Rhew et al., 2018). The expectations and rigor students face to reach goals and success can become too much. Having confidence in success and abilities can help strengthen students’ desires to persevere through tough obstacles, while low self-esteem and low self-efficacy can create a sense of failure in a student (Rhew et al., 2018).

The role of noncognitive factors in shaping school performance are considered just as important as academics. Studies show that a student’s success is not grounded just in their GPA but instead the grades revealing qualities such as motivation, perseverance, ability to accept criticism, time management, and study skills (Bowen, Chingos, & McPherson 2009). Ultimately it is these qualities, more so than content knowledge, that signal which students are likely to excel in their studies and persevere in their schooling.
Further research extends these qualities to be a student’s beliefs about his own intelligence, his self-control and persistence, and the quality of their relationships with peers and adults (Bandura, 1994; Bandura & Schunk, 1981; Schunk & Hanson, 1985; Wentzel, 1991; Zimmerman, 1990). There are a multitude of reasons beyond academia shown to have an impact on a student and her impact on student success.

Students in a middle school leadership course come with limited experience in leadership and lack skills in public speaking. A growth mindset proposes that regardless of experience or knowledge success is attainable for students (Dweck, 1999). Confidence naturally aligns with the message of growth mindset, for example someone with a fixed mindset receiving feedback on a speech could shut down consider themselves a failure, while a student with a growth mindset could have the complete opposite reaction and take the feedback to improve. Starting middle school or any difficult task with a fixed mindset can have implications for a student, particularly negative implications. As Keller (1999) asserted, it is possible for a motivated learner to make minimum effort in learning because of some internal factors such as confidence. This means students do not believe in their abilities to perform the learning tasks. Low self-esteem and low self-efficacy can create and sense of failure in a student.

Growth mindset allows students to be okay with mistakes (Yeager et al., 2018), however self-efficacy is determined by past success. A viewpoint to consider is that if you have a growth mindset and are comfortable with failure then your self-efficacy can withstand the stressors of academic and social pressures. The interlocking of both self-efficacy and growth mindset on student achievement and performance can create a sturdy base on which a middle school student can develop (Lorsbach, 1999). Supporting
students to help them develop a growth mindset has been offset with interventions. These interventions are intended to change targeted behaviors and attitudes to be effective, with studies showing both short- and long-term improvement (Blackwell et al., 2007; Trzensniewski, & Dweck, 2013; Yeager et al., 2018). On the other hand, Bandura (1997) has argued that “although belief in the acquirability of talent is conducive to high personal development, it does not necessarily ensure it. Many people are reluctant to go through the hard work of perfecting skills that enable them to perform at extraordinary levels” (p. 119). Consequently, a growth mindset alone does not necessarily protect against negative outcomes (Yan et al., 2014).

Currently in a time of pandemics and a shift to online learning, mindsets can help frame how an individual will address changes. A fixed mindset can account for failure during change while, a growth mindset can account for how to improve during change (Dweck, 2006). Neuroleadership Institutes (NLI) recent report on “Growth Mindset Supports Organizational Disruption” (Derler & Nadler, 2020), cited growth mindset as the number one soft skill for digital transformation, and growth mindset has already enabled major business transformations pre-covid (Derler & Nadler, 2020). Therefore, growth mindset offers promise to individuals to face challenges and preserve in change. As Bolaer (2019) states “The myth that our brains are fixed and that we simply do not have the attitude for certain topics is not only scientifically inaccurate; it is omnipresent and negatively impacts events in our lives” (Boaler, 2019, p. 5).

Local Context

Greenlake Middle School (pseudonym) is ranked one of the top middle schools in the County School District of South Carolina. Located in the foothills of the
Piedmont, the school opened its doors in the fall of 1999. The school currently has approximately 1,120 students grades six through eighth. The school is equipped with 64 classrooms, sports fields, computer and GTT labs as well as state of the art media center and promethean boards in all classrooms. Administration consists of a head of school as well as vice principals at each grade level that roll up with their students yearly. There are ninety-five teachers, professional staff, and support staff to give the students a reasonable student to teacher ratio.

Test scores for this school are above average with recent test data showing almost 40% of the student population exceeding expectations. This school has received the rating of “Excellent” in 2019 on overall state report card rating and has won numerous awards and honors including its concert orchestra program. The school curriculum offers honors courses as well as STEM and CTE courses. Alongside great academics, the school also offers an extensive variety of clubs, athletics, academic teams and services to all of the students.

Over the last few years during the pandemic, social and emotional learning (SEL) has taken on a new context for the world, and more specifically for the students in the County School District in South Carolina. The district is aware of the value of social emotional development of students pre pandemic, but more now than ever the district is budgeting in curriculum to support student social and emotional health. Using Rethink Ed program, students receive 1-2 lessons per month to strengthen social and emotional skills, along with a partnership with a Mental Health Center, On Track Team, and school counselors. A strong structure has been built to support students SEL however, the district leans on students’ parents to be the ultimate support for SEL development. Using
an added layer of innovation with a growth mindset lesson weaved into an already structured related arts curriculum can only support other non-cognitive skills in students such as self-efficacy and perseverance. Growth mindset theory is heavily supported by neuroscience specifically the concept of neuroplasticity moving the theory of how the brain works into practice. According to Spanish neuroscientist Santiago Ramon y Cajal, every man can, become the sculptor of their own brain, having the ability to adapt and meet the various challenges that a person may face in life (Abiola & Dhindsa, 2012).

Applying the noncognitive factor of mindset in an academic setting can support social and emotional health in ways that could extend beyond what the SEL curriculum has to offer. Farrington et al. (2012) conducted a review of the role of noncognitive in shaping performance, with five general categories relating to academic performance: academic behaviors, academic perseverance, academic mindsets, learning strategies, and social skills. Academic mindsets are the psycho-social attitudes or beliefs a person has about themselves in relation to academic performance, however they are steeped in the research of Dweck’s (1986) implicit personality theory and Bandura (1977) social learning theory with research showing simple, short-term interventions directed at changing a student’s mindset having lasting effects on a school performance (Farrington et al., 2012).

Another important piece built into the district program is the Capturing Kids Heart curriculum that has been purchased for the district. In the schools, the Capturing Kids Heart material resources have been purchased for implementation in the school building including training for teachers to support a cohesive school performance. Greenville county district set priorities for all middle level students for the 2021-22 school year, with priority (3) stating; all middle schools must provide strong social
emotional supports to ALL students (Standard Operating Procedure (SOP), 2021). The Middle school goal (3) specified that in order to continue a student-centered learning environment and provide students with an exceptional middle level experience, all staff will implement the district and school-wide SEL plan and empower students to use strategies we have acquired through Capturing Kids Hearts and outlined in This We Believe, as noted through classroom and school observations (SOP, 2021).

LeadWorthy, the context for this research and intervention, is a course that builds personal responsibility and leadership skills through role plays, group activities, speeches and projects. LeadWorthy counts as an education elective in both middle school and high school and provides a system of skills and techniques that enable teachers to speak to the emotional and psychological needs of students (Flippen Group, 2021). Interconnected with CKH and LeadWorthy are the noncognitive skills of mindset and self-efficacy. In order to maximize the opportunity to provide participants in the course more exposure to these skills to support the strengthening of student’s connection, social and emotional learning as well as goal setting, effort and performance, added growth mindset content would be an appropriate choice.

Statement of Problem

This study examined the problem of practice resulting from middle school students participating in a teen leadership course and the lack of self-efficacy. According to Huei-Yu Chen (2007), for students to learn they must first want to learn and believe that they can learn. They must have not only the motivation to learn but also the confidence in performing the given learning task. The basic sign of motivation is effort that strongly influences performance. As Keller (1999) asserted, it is possible for a
motivated learner to make minimum effort in learning because of some internal factors such as confidence. This means they do not believe in their abilities to perform the learning tasks. Particularly speaking in front of the class and participating in leadership development activities that involve peer interaction. Implementing a growth mindset intervention to students using a digital portfolio may conceivably increase student’s self-efficacy in the course.

**Purpose Statement**

The purpose of this action research was to implement and evaluate the impact of a growth mindset innovation of middle school students aimed to improve and develop self-efficacy using a digital working portfolio.

**Research Questions**

Two questions guide this innovation student:

1. How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course?
2. What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset innovation?

**Statement of Research Subjectivities and Positionality**

I identify as a white, heterosexual female in her mid-forties, married with three school-aged sons. For undergraduate and graduate school, I pursued degrees in elementary education, ESL, and reading specialist focus. Pursuing a degree in educational technology was an easy choice, it will, with hope allow me to make a change in how asynchronous training can impact virtual school leaders’ leadership. While in my studies, I would like to develop my skills in research, instruction, and educational technology to
offer insight and make a change to our systems to better our student's educational experience.

The ideal educational technology professional would be grounded in the basic practice of education and have a clear pedagogy that steers them in their practice. Technology in education can look unique depending on the setting, but what it isn’t is a student staring at a computer. A true professional will be knowledgeable about the technological resources available to them and the research on what is most effective alongside best practice of implementation. For me, I have a clear perspective on my practice and what I believe the educational experience should look like, since 2006 I have been a virtual teacher, starting at the high school level as an elective’s teacher. This experience taught me what I did not want virtual schooling to look like, which was a business to make money and not to develop students. When I started teaching 19 years ago overseas, I was teaching English as a second language to kindergarten students from all over the region but did not have my teaching certification at this time, but I knew this was my future career, so I started taking online courses through Arizona State University. At the time internet was expensive and slow, using dial up. This experience helped define how I taught later down the road virtually, it opened my eyes to what works in distance learning, and what does not.

In my current role as a related arts teacher at a local middle school, I have been given the opportunity to teach a leadership course that directly aligns with my previous role as a leadership trainer working with virtual school leaders. Working for four years with principals, assistant principals and directors, my primary objective was to create and implement leadership training. Leaders at this capacity tend to have strong self-efficacy,
purpose, and motivation. Students in middle school, however, are experiencing a uniquely difficult growth period where self-efficacy, mindset and purpose are lacking. Over this last semester I have recognized the limited perceptions I have of self-efficacy. Working with experienced leaders, confidence and self-efficacy are abundant, however middle school leaders are just in the process of developing these traits.

When I started as an instructional coach in my company, we were given a course from Stanford University from Jo Boaler based on mindsets in the classroom. Since completing the course, I have been intrigued with the research of growth mindset and have looked at multiple aspects of growth mindset, mostly how it affects students learning, teaching and personal experiences. This course also pushed my boundaries personally, as I started shifting my thinking and actions to a growth mindset. With my research, I look forward to looking at more current research that connects growth mindset, leadership and middle school age student’s self-efficacy. Because of the newness of my research and the individual experience of developing a growth mindset, my research paradigm lands in the constructivist model. The constructivist paradigm, specifically social constructivist believe that individuals seek understanding of the world in which they live and work (Creswell, 2014).

Mylene Culbreath poses the question in her 2016 video, “Where do you stand in relation to others?”, to this I answer, alongside the participants. My role in my school is as a Teen Leadership electives teacher. I work directly with my participants in a teacher student capacity. My primary purpose is to develop teen leaders to help build them up to be successful both academically and socially. This is a helpful position to be in, particularly for my research. The students I work with consider me a superior and may
feel consequential when speaking with me. However, our school runs with an inclusive mindset and students may feel some ownership in the classroom. This could position me poorly, as students may think that what I am researching is a grade incentive and go in with preconceived ideas and expectations. With my current job title, I have access to students ranging from 6th grade to 8th grade, which will allow me to survey and interview a wide variety of participants in person. Inside our school district, there is a high value placed on research and it has helped create opportunities for our schools. This will position me in a positive space when I submit my research proposal, as my action research will help to identify if growth mindset will support self-efficacy in a teen leadership course.

The research that I am conducting may be limited or biased by my beliefs about educational technology due to my strong opinions on how I think educational technology should look. Working for the last 13 years in a virtual setting I have clear ideas of what I think a virtual leader should be able to do. To quote Peshkin, “I hold the view that subjectivity operates during the entire research process”, and I believe my biases and opinions will filter throughout my research (Peshkin, 1988). My passion for a growth mindset and education can be somewhat influential in my thinking, so I will have to work hard to be self-aware of the moments when objectivity needs to take priority.
Definition of Terms

Digital Portfolio: Digital learning is a broad term encompassing online learning, blended learning and other use of educational technology (Kennedy & Ferdig, 2018), also a portfolio is a goal-driven, organized, collection of materials that demonstrates a person's expansion of knowledge and skills over (Milman, 2014).

Fixed Mindset: The idea that skills and abilities are fixed, and they cannot be changed. It is what you are born with (Dweck, 2006).

Growth Mindset: The idea that skills and abilities can be improved, and the development of skills and abilities is the goal of the work you do (NLI, 2019 p.3).

Leadership: "The process of interactive influence that occurs when, in a given context, some people accept someone as their leader to achieve common goals" (Silva, 2016, p. 4).


Public Speaking Self-efficacy Scale (Warren 2011): Developed using Bandura’s (1986) theory as a guide to factor analysis. Each sub-dimension of the scale loaded on one factor. These four uni-dimensional subscales were used for the remaining analyses. This final scale included 26 items. More specifically, the mastery experiences subscale included five items (a = .863). The vicarious experiences and social persuasions subscales both included six items (a = .824 and .911, respectively). Finally, the physiological/affective states subscale included nine items (a = .929)

Self-efficacy: The belief that one can execute needed steps to achieve a goal (Bandura, 1977).
Speaking Self-Efficacy Survey (Asakereh & Dehgbannezbad, 2015): The pilot-tested and validated satisfaction with speaking classes questionnaire developed for this study comprised 38 items, based on a Likert scale ranging from one (very unsatisfactory) to five (very satisfactory). The speaking skills self-efficacy beliefs questionnaire was adapted from Rahimi and Abedini (2009), Gahungu (2007), Wang et al. (2013), and Saeidi and Ebrahimi Farshchi (2012). It comprised 28 items, based on a Likert scale ranging from one (strongly disagree) to five (strongly agree).

Mindset Assessment Profile Tool (MAP): A survey designed to first as a three-question survey using a six-point scale from 1 (strongly agree) to 6 (strongly disagree) developed by Dweck et al. (1995). Then more fully developed into the 8 question survey.

LeadWorthy: A course built by Capturing Kids’ hearts, to help students take responsibility for themselves, while equipping them with the skills needed to handle difficult situations (Waters et. al., 2019).
CHAPTER 2

LITERATURE REVIEW

The purpose of this action research was to implement and examine the impact of a growth mindset innovation module for middle school students using a digital portfolio on students’ self-efficacy in a leadership course. The focus of this review is on the main research questions: (a) How can a growth mindset intervention using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course and, (b) What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention?

Methodology

The methodology for the literature review was a six-part process. For each variable relevant to each research question, a database search was performed to find appropriate literature using online resources such as University of South Carolina online libraries and databases. ERIC, Sage Publishing, ProQuest, and Psych INFO databases to gain sources relevant to my search. Mining references of applicable journals and research also helped identify other relevant literature.

Using terms such as (a) leadership theories, (b) student leadership, (c) leadership course (d) leadership skills in middle school launched my review into leadership. The following keywords were used in the searches: Students [and] leadership, school [and] leadership, theories [and] leadership.
An important part of the search was digging into growth mindset outside of just the theory or its relation to students. Terms such as growth mindset [and] self-efficacy, growth mindset [and] students, growth mindset [and] interventions/professional development, growth mindset [and] science, neuroplasticity were used to develop the discussion of a growth mindset. Another strategy used was social media outlets, whereby following blogs and articles led me to better understand the recent research and conversations in the realm of a growth mindset.

The process started with a search of the databases to find sources relevant to the general idea of self-efficacy. The term returns a large amount of information. Terms were used in unison with multiple terms to identify research in this area. Terms such as students [and] self-efficacy, self-efficacy [and] schools, self-efficacy [and] learning, self-efficacy [and] learning [and] challenges, in addition to the searches, resources were found from Google scholar.

Lastly, the final part of the search looked heavily into the concept of digital portfolios as it pertains to students and growth mindset as well as their relation to interventions. Terms such as digital[and] portfolio, e-portfolio [and] students, digital portfolios [and] growth mindset, adult learning [and] professional development, constructivism [and] adult learning, constructivism [and] andragogy, and professional development [and] constructivist were used to identify literature.

The chapter will first discuss aspects of self-efficacy in the capacity of education and the classroom while addressing specific alignment to a growth mindset, achievement, and learning. Next, the growth mindset will be viewed through the lens of its foundation
to its implications for students. Lastly, the literature will examine digital portfolios and their implications on students learning.

**Growth Mindset**

As students grapple with change and challenge, a growth mindset is relevant and timely. Failure can be a painful experience, but it does not define you. Instead, it is a problem to be faced, dealt with, and learned (Dweck, 2006). The idea that intelligence is malleable, and perceptions of that intelligence can be altered was groundbreaking. In this section, the literature surrounding growth mindset, which emerged from the implicit personality theory and entity theory, will be examined, and its implications on school leaders, teachers, and students as well as schools will be considered. Lastly, a focus on how to measure the mindset of a student will be presented, looking specifically at validated survey tools.

**Growth Mindset Theory**

In the 1950s, the term *implicit personality theory* was new; however, the idea was relatively old, originally used by Bruner and Tagiuri to describe assumed relationships of traits (Schneider, 1973). According to Kelly (1955), a major component of the personality involves personal constructs or naïve assumptions about the self and the social reality (Dweck, Chiu & Hong, 1995). Schneiders' review of the literature on this theory resolved that first, possible techniques for assessing these theories are not yet useful, and second, a lack of research has been imposed on the theory.

Dweck and Goetz (1980) confirmed what researchers believed about children’s attributions could predict helpless or mastery-oriented response depending on how they interpreted a failure that brought up questions like what is intelligence that moved Elliot
and Dweck (1988) to pursue further research (Dweck & Yeager, 2019), yet with the key question still unanswered, Dweck and Bandura launched into the mindset research (p.483).

There are two implicit theories, entity and incremental. They are opposite assumptions people may make about the malleability of personal attributes (Dweck, Chiu & Hong 1995). Entity theory is the idea that a highly valued personal attribute, such as intelligence or morality, is fixed or nonmalleable. Incremental theory is the opposite, where the person believes these attributes to be malleable, changed, and developed (Blackwell et al., 2007; Dweck, Chiu & Hong, 1995; Dweck, 1999, 2006; Dweck & Yeager, 2019; Schneider, 1973). The terms growth mindset and fixed mindset align with these two theories, with growth mindset and fixed mindset being more user-friendly terms (Dweck, 2006).

Connections appeared between meaning systems that might be called variables like goals, beliefs/effort beliefs, and behaviors and showed they could be aligned with mindsets. For example, with a fixed mindset, a person might not take risks or face challenges toward specific goals due to a mindset (Dweck & Yeager, 2019). The development of growth mindset theory moved researchers and practitioners to better understand its implications with students, schools, and leaders.

**Growth Mindset Studies, Interventions, and Implications**

Launching from Dweck and her teams' research, a multitude of studies have looked at the positive effects of mindset interventions on students learning, in mathematics, and around mistakes and effort (Blackwell et al. 2007; Costa & Faria, 2018; Dweck, 2009). Blackwell et al. (2007) set to identify what psychological mechanisms
enable students to thrive under challenge while others with equal ability do not. The results show incremental theory was positively associated with positive effort beliefs and low helpless attributions. Costa and Faria (2018) took their research to an international level, looking at the context of cultures outside of the United States and the context of implicit theory, citing implicit theories across the societal difference between collectivist or individualist cultures, with results indicating incremental theorists are more likely to show higher achievement. Participants in another comparative research study looked at the U.S., Europe, and China relating leadership styles to error learning and noted differences across cultures (Bligh et al., 2018).

**Support from Neuroscience**

The neuroscience research of growth mindset has the potential to play a pivotal role in developing leaders, teachers, and students. The neuroimaging findings offer an understanding of the brain, indicating the specific areas of brain activation which could, in turn, correlate with the behavioral results, finding growth mindset was related to critical error-monitoring and behavioral adaptation in the brain (Ng, 2018). A meta-analysis aimed to synthesize the research around the effects of inducing a growth mindset using neuroplasticity on motivation, academic achievement, and brain activity (Sparks, 2018), with the approach aimed to evaluate the inconsistencies from previous research on growth mindset (p.28). Findings showed interventions using the research of neuroscience had a positive effect, specifically on at-risk students (Sparks, 2018).

Neuroleadership Institute is a brain-based solutions organization that has done extensive research on growth mindset and how it can support adaptive, resilient, and inclusive leaders (Derler & Baer, 2018; Derler & Cardero, 2018; Derler & Nadler, 2020).
Most recently, a case study conducted by the institute used data over the last six years of research (Derler & Baer, 2018) where they identified growth mindset initiatives can adapt to major change and disruptions with three key benefits; (1) behavior change at scale, (2) increase employee engagement, and (3) greater workplace satisfaction.

**Applications for Leadership**

Limited research is available examining student leadership and growth mindset, however available to be considered is leadership in the general sense. Leadership for today’s middle school students begins with discovering who you are, what you care about, and why you do what you do (Bowman, 2013). Beyond the neuroplasticity research, implications from interventions have identified performance (behavior), perseverance, and creating a culture of learning and mistakes as implications of growth mindset (Burnette et. al, 2019; Kouzes & Posner, 2019; Zeng et al. 2019; Bligh et al., 2018; Dweck 2006; Yeager & Dweck, 2020; Blackwell et al., 2007; Caniëls et al., 2018).

Today’s students and leaders should find value in evolving a growth mindset to support the process of discovery. With a gap between the skills students acquire and the skills students will need in a professional capacity traditional learning has fallen short (Soffel, 2016). The World Economic Forum report analyzed 213 studies pinpointed 16 skills required in the 21st century with leadership being a key character quality. To engage and sustain middle school students on a journey of discovery Flippen (2016) saw the need for a program to help at-risk youth, that developed into a program for teen leadership developing the identified performance behaviors necessary with a researched-based curriculum and re-enforcing leadership skills. Included in these behaviors are self-awareness, self-motivation, goal setting, social skills, and communication. Kouzes and
Posner (2016) in previous research found a measure of five exemplary leadership practices related to performance, with results showing those that work with a growth mindset statistically engage in these practices more often than those with a fixed mindset (Kouzes & Posner, 2019), revealing leaders’ performance and behavior are directly aligned with a growth mindset. A growth mindset can facilitate improvement in self-efficacy. Students with more of a growth mindset characteristically had higher levels of self-efficacy than students with more of a fixed mindset (Dweck & Master, 2009).

Bligh et al. (2018) set out to understand how organizations can allow increased risk-taking, learning, and innovation, with results not only showing a correlation between leader’s impact on individuals who lead with a growth mindset but also the connection between leadership styles, error-learning, and growth mindset. In unison, a new vision for education seeks to better understand the skill gap from learning to employment with some top lacking skills being resilience, flexibility, and stress tolerance according to employers (Zahidi et al., 2020), with suggestions focused on developing these skills early on with students. Bligh et al. study was meant as a replication of Yan et al. (2014) highlighting learning and innovation in the global market, noting that mistakes are going to happen and how you deal with the matter in association with leadership. Work engagement was highlighted in studies, each having unique connections with leadership styles and growth mindset, and each showing a positive correlation between the two (Caniëls, Semeijn, & Renders, 2018; Zeng et al., 2019). For example, interventions surrounding growth mindset, as well as studies and research, point to specific benefits of developing or at the least understanding more about growth mindset. As noted, the literature connected to challenge, change, and innovation in the sphere of a student, with
a growth mindset being an attribute that matters. Fox and Barrera (2020) suggest that educational institutions would benefit from a mindset intervention to promote growth mindset concluding a selective advantage for students academically. Schools that actively develop growth mindset can guide students to face challenges and change.

Issues with Growth Mindset Research

The negative aspects of growth mindset interventions were also revealed in the literature, highlighting the science not catching up with the research as well as the failure to replicate interventions and how the theory overpromised and underdelivered (Dentworth, 2019). A specific intervention conducted by Foliano et al., (2019) in the UK over a 6-month period was set to replicate previous research of aligning achievement with a growth mindset. Findings showed no statistical differences between control and intervention groups. However, the interpretation of the study alluded to three reasons why the study might not have worked, including (a) the program not delivered as intended, with it being too short to alter perceptions; (b) the control school had also had a growth mindset training previously and could be using it as well, and (c) the age of the pupils being too young and cognitively not able to identify mindsets.

Measuring Mindset in Research

The measurement tools used for mindset were the Dweck three-item questionnaire mentioned earlier, the Duckworth and Quinn eight-item questionnaire, and the locus of control twenty-eight-item questionnaire assessing the extent to which the participant believes that academic performance is a result of internal and external factors (Burgoyne et al., 2018). Within each intervention, specific measurements were used to address areas of either students, schools, or leaders. The first measurement of mindset was a three-
question survey using a six-point scale from 1 (strongly agree) to 6 (strongly disagree) developed by Dweck et al. (1995). Using only three items as the construct has a simple unitary theme, as repeatedly rephrasing the same idea would have led to confusion and boredom (p.269). Mindset Works, Inc. founded by Dweck and Blackwell expanded the mindset measurement to include an eight-item questionnaire as well as a What’s My School Mindset assessment (WMSM) (https://www.mindsetworks.com/default). Two validations studies looked at the Implicit Theories of Intelligence scale, both in comparison to different mindset scales (Burgoyne & Macnamara, 2020; Ingebrigtsen 2018). Burgoyne and Macnamara (2020) found that the mindset assessment profile from Mindset Works Inc. demonstrated relatively low reliability and poor convergent and discriminant validity, while the Implicit Theories of Intelligence Questionnaire showed reliability of $\alpha = 0.94$.

Worth mentioning as well is the Grit scale developed by Duckworth and Quinn (2009), used in a growth mindset intervention at an organizational level (Burgoyne et al., 2018). This intervention was multifaceted addressing whether a mindset should be considered and an element of self-determination, and whether the brief online intervention could alter participants’ mindset of grit and locus control (p.22). The Locus-of-control scale measures the extent to which a person understands events being the result of his or her behavior, under their control (Craig & Andrews, 1984). This seventeen-item scale has shown to have satisfactory internal reliability with a general expectancy scale ($r = 0.67$).
Self-efficacy

Working to better understand the structure of an individual’s behaviors around choice, motivation and more, researchers set out to look at the cognitive mediator of action self-efficacy. Bandura is the pioneer around the theoretical framework of self-efficacy, defining it as the belief that one can execute needed steps to achieve a goal (Bandura, 1977). In other terms, it is how possible an individual thinks it is that he or she can do a task or accomplish a task. Believing an individual can accomplish a task weighs heavily on self-efficacy levels. While the conceptual system of a person’s behavior based on self-efficacy as the central role in determining behavior and outcomes (Bandura, 1977). Therefore, it can be established that efficacy expectations add value in specific situations, particularly stressful situations. People who are faced with a challenge will depend on their self-efficacy to determine how they will react to that challenge (Bandura, 2020). Thus, a growing body of research relating self-efficacy beliefs to career and academic outcomes has been generated. This research has important implications for counseling, educational, and vocational psychology theory, and practice (Multon et al., 1991)

Students’ perceptions of their abilities account for learning outcomes, as well as achievements. The perceptions, environment, and experience of success can all be predictors of self-efficacy on a specific task (Zimmerman, 2000). For example, a student may assume she is better at math than English. If she is performing the task in a distracting environment as opposed to a quiet environment, or she has had past success on a specific task (Zimmerman, 2000). With a student’s perceptions of her abilities
weighing heavy on outcomes, the more capable students judge themselves to be, the more challenging the goals they embrace.

Self-efficacy can be a predictor in several aspects of behavior that are important to learning. Among these is the choice of activities that a student makes, the effort put forth, and persistence in accomplishing a task (Bandura, 1977, 1982, 1989; Schunk 1995, Zimmerman et al., 1992). Indicating that a student’s choice can be determined by levels of self-efficacy, particularly if students are asked to do something that could be considered new or uncomfortable may hesitate to move forward with that task.

Having a strong sense of self-efficacy can potentially affect the four major psychological processes of human function including cognitive processes such as self-control, motivation process such as guiding actions, affective processes like coping skills, the selection process that involves the life choices you make (Bandura, 1994). Much research has been conducted on the four major psychological processes through which self-beliefs of efficacy affect human functioning: The stronger the perceived self-efficacy, the higher the goal challenges people set for themselves and the firmer is their commitment to them (Bandura, 1994). Understanding a student’s self-efficacy level can benefit learning outcomes. If a student shows low self-efficacy, developing their self-efficacy can motivate a student to set higher goals or take on new challenges (Bandura, 1994).

Developing Self-efficacy

Identifying the importance and potential of self-efficacy naturally moves to the next step of cultivating self-efficacy. With consideration of the literature on the topic, it is perceived that developing self-efficacy with a growth mindset innovation can be a
productive and useful platform. In a meta-analysis of 39 studies, Multon, Brown, and Lent (1991) found a statistically significant relationship between self-efficacy and academic performance; specifically, they found that self-efficacy accounted for approximately 14% of the variance in students’ performance. Bai et al. (2019) found students who believe they can be successful reported more adaptive learning patterns. They focused on the three variables of motivation, self-efficacy, and growth mindset influencing social and emotional learning writing strategies. Results from the study showed self-efficacy and growth mindset, were crucial for self-regulated learning writing strategy use, stating educational implications points to the essential promotion of both variables by using feedback, encouragement, and opportunities to fail and grow (Bai et al., 2019).

The value of cultivating self-efficacy through behavioral change has been seen in research designed to enhance coping efficacy in difficult irrational participants (Bandura & Adams, 1977, Bandura et al., 1977, & Bandura et al., 1980) completing various treatments in performing different tasks where a participant is not efficacious. Participants shut down and did not attempt to complete a task if they had low self-efficacy with research identifying lack of coping skills and fear as predictors of task performance. These studies were the springboard to identify the practical applications in the classroom to help create a space for self-efficacy development, including classroom environments. Consequently, perceived self-efficacy and outcome expectations are critical elements of the learning environment because they are learned perceptions associated with student motivation, for example, a student who has a teacher that is not transparent with expectations and creates distrusts in a student’s learning can directly
affect the confidence in that student's thought process on their abilities and talents (Lorsbach & Jinks, 1999). To conclude, the role that self-efficacy plays in the development of student achievement is convincing. Research has aligned self-efficacy to student achievement as well as outcome and effort, providing a better understanding of the benefits of addressing self-efficacy in classroom environments with pedagogy and interventions to support development.

**Measuring Self-efficacy**

Sherer and Maddux (1982) constructed and validated the original Self-Efficacy Scale starting with a 14-point Likert scale ranging from “strongly agree” to “strongly disagree” with 36 items on the original version, reducing the items to 23 after determining the optimal number of interpretable factors. Cronbach alpha reliability coefficients of .86 and .71 were obtained for both the general self-efficacy and social self-efficacy subscales (Sherer & Maddux, 1982), with similar results in organizational research across the world (Chen et al., 2009).

The self-efficacy scale has two subscales there is the general self-efficacy subscale and a social self-efficacy subscale. They both have adequate reliability with each predicting past success in vocational, professional, educational, and military areas (Sherer et al., 1982; Sherer & Adams, 1983; Luszczynska, Scholz & Schwarzer, 2005; Usher & Pajares, 2008). Study one in Sherer et al. (1982) research set out to construct, assess, and determine the reliability of a dispositional measure of self-efficacy. Another more recent study set to explore the relationship between general self-efficacy and a variety of other psychological constructs such as well-being, health behaviors, and
coping, with the study identifying similar results as in previous studies with reliability 
(\(\alpha = 0.86\) and 0.94) (Luszczynska, Scholz & Schwarzer, 2005).

The last three decades have generated a multitude of studies and validations based on self-efficacy, with researchers moving to generate a new scale. The research argued in a validity study of the New General Self-Efficacy Scale (NGSES) by Chen et al. (2001), that the GSE measure data falls short, as well as possesses ambiguity surrounding the construct. The construct of the new scale began with a study to help develop the scale with seven new additional items created, and seven were carried over, using a five-point Likert-type scale, with Study Two correlating with self-esteem (Chen et al., 2001), with high internal consistency reliability results (\(\alpha = 0.86\) and \(\alpha = 0.90\)). The current version of the NGSES is an eight-item, five-point Likert-type scale. Another measure developed in German and then translated into 28 different languages is the Schwarzer and Jerusalem’s General Perceived Self- Efficacy Scale and is widely used outside of the United States, with a variety of samples reporting the internal consistency (\(\alpha = 0.75\) to 0.90) (Scherbaum et al., 2006). Significant research and growth have occurred since the origins of the GSES, with recent research confirming that the NGSES shows potential in distinctive studies.

Furthermore, self-efficacy measurements have moved to identify components around public speaking and speaking as well. Warren (2011) developed through Sellnow’s (2009) components of an effective speech, as well as Five items were added to Usher and Pajares’ (2009) original scale were used to develop items for the public speaking self-efficacy scale. Ultimately, the final scale included 26 items with each subscales reflecting an internal consistency of (\(a = .824-.929\)) (Warren, 2011). Asakereh
& Dehghannejad (2015) continued to develop the self-efficacy scales and moved away from the idea of public speaking self-efficacy and began to address the components of speaking in English as a second language. The pilot-tested and validated satisfaction with speaking classes questionnaire developed for this study comprised 38 items, based on a Likert scale ranging from one (very unsatisfactory) to five (very satisfactory). The speaking skills self-efficacy beliefs questionnaire was adapted from Rahimi and Abedini (2009), Gahungu (2007), Wang et al. (2013), and Saeidi and Ebrahimi Farshchi (2012). It comprised 28 items, based on a Likert scale ranging from one (strongly disagree) to five (strongly agree) (Asakereh & Dehghannejad, 2015).

**Leadership**

It is important to better understand the nuances of leadership, but more importantly to better understand leadership specifically in the framework of students. Therefore, in this section, the review of literature will focus on identifying a clear definition of what the term leadership implies. Once identified, the literature will focus on connecting the chosen definition to student leadership. Next, efforts will focus on better understanding specific leadership theories and their context to student leadership. Lastly, this section will concentrate on the characteristics, competencies, and nuances of effective leadership including training and development.

**Definition of Leadership**

Acquiring a consensus on the definition of leadership can be an arduous task. With the most obvious starting place, the Oxford Dictionary, the basic definition is “the action of leading a group of people or an organization,” with Merriam Webster stating it is “the act or an instance of leading, capacity to lead” (“Leadership,” n.d). Volckmann
(2012) interviewed Kellerman, a Harvard professor of public leadership and author; she stated that there are 1,400 different definitions of the words leaders and leadership, further deepening the search for an agreed-upon definition. Written principles of leadership can be found in Egypt in the Instruction of Ptahhotep (2300 B.C.E.). Confucius and Lao-tzu of the sixth century B.C.E. discussed the responsibilities of leaders and how leaders should conduct themselves (Bass & Bass, 2008), with the focus of leadership as a trait and not a process. For this research, we will focus on twentieth-century literature aligned with defining and understanding leadership.

Bass and Stogdill tend to be synonymous in leadership research, however, both hold an equally powerful individual stance in research as well. In 1945, leaders at Ohio State initiated a ten-year study, an effort to find a better understanding of leadership by looking at the performance demands made upon the positions, in education, business, and military (Stogdill, 1955). Stogdill is also associated with important research that challenged the trait-based theory of leadership and argued that characteristics are relevant to specific challenges, values, and concerns of followers (Stogdill, 1948), then defining leadership as “the process of influencing the activities of an organized group in its efforts toward goal setting and goal achievement” (Stogdill, 1950, p.4), and his ideas continue to be referenced in more modern definitions. Arching away from the old ideals as Stogdill had, Bass took to defined leadership as transformational, stating that “leadership is an interaction between two or more members of a group. Leaders are agents of change, persons whose acts affect other people more than other people’s acts affect them” (Bass & Stogdill, 1990, p.19).
Winston and Patterson's (2006) study address the problem of varied definitions as did many other researchers including Silva (2016), each examining the literature and settling on language for a new definition. Silva stated that “Leadership is the process of interactive influence that occurs when, in a given context, some people accept someone as their leader to achieve common goals” (p.3). Kotter (1988) stated that leadership is “the process of moving a group or groups in some direction through (mostly) non-coercive means” (Rosari, 2019 p.19). Three essential elements that are presented in most leadership definitions and agreed upon in Roasri (2019) and Summerfield (2014) are (a) mutual purpose, (b) influence, and (c) results or real change is intended, with a possible fourth being the act of followers which can also be seen in earlier definitions as well (Stogdill, 1950, 1974; Bass,1985, 1988, 1990). The integrated definition shared from Winston and Patterson (2006) aligns with the essential elements and consequently developed the most comprehensive in the literature. After reviewing 160 articles and books containing a definition of leadership, Winnson and Patterson (2006) defined a leader as “one or more people who selects, equips, trains, and influences on or more follower(s) who have diverse gifts, abilities, and skills and focuses the follower(s) to the organization’s mission and objectives causing the follower(s) to willingly and enthusiastically expend spiritual, emotional, and physical energy in a concerted coordinated effort to achieve the organizational mission and objectives” (p.7). To guide this study, I will use the Winston and Patterson (2006) definition to support answering the research question.
As outlined in the literature review tackling literature around learning leadership skills it can be a mountain, for the focus of this study we will specifically focus on the ideas of constructivism in development, specifically around leadership.

**Constructivism and Learning**

Organizational development can be viewed in classical and new OD practices (Marshak & Grant, 2008). The classical approach to OD included positivist views when associating with the social science focusing on data-based change, and the scientific approach. The new practices move to the constructivist and postmodern approaches with new ideas about change dynamics, and how people think about change in organizations (p.S9). Leadership mindsets that respond to the complexities of contemporary circumstances seen as requiring a particular adeptness have shifted developing leadership from a skillset to a mindset (Kennedy et al., 2013).

It is important to ask what occurs when educators introduce new learning models, and how they will construct a student’s way of learning or understanding. Learning theories are explanations, research, historical context, and a response to these questions (Harasim, 2012). Constructivism learning theory will be the lens in which leadership learning is considered by looking at case studies in blended learning, adult learning, and K-12 learning models. Learning theory is the marriage between theory, epistemology, and science. Theory can be thought of as an explanation generated by questions with an explanation that is scientifically developed with historical construct and informs (Harasim, 2012). Other contradictions come from the learner determining their learning, and it is specific to the interaction of these two variables that creates knowledge (Ertmer & Newby, 1993).
and the role of the educator (Huang, 2002). Allowing discussion, collaboration, and facilitation, the teacher moves from being the expert and allows the learner to have choice and control in their learning.

Creating cognitive tools which reflect the knowledge of the culture in which they are used, as well and insight and experience from individuals is another focus on constructivism (Ertmer & Newby, 1993). In an educational technological learning environment, it can be complicated to express these tools, however; flip grid, video, digital portfolios, and other educational technology enable learners to express their cognitive tools in real-world experiences. For example, a student would be asked to take a video of themselves building a structure, or in math, a group might be given a real-world problem to solve together in a virtual classroom, with a choice to pick what problem everyone might want to solve. In constructivist instruction the learner is more than an active processor of information, the learner uses experience and knowledge to interpret the information given (Ertmer & Newby, 1993). It is important to consider instruction as more of a teacher facilitator and student guide. From a theoretical context, the inclusion of student voice is grounded in constructivist learning theory, with authentic activity involving hands-on activities that are relevant and meaningful to the learner (Stefl-Marby et al., 2010).

**Developing Leaders**

There are two strategies when developing leaders. The first focuses solely on behaviors, the second option focuses on cognition, you can’t change the behavior without changing the thinking (Ledford & Williams, 2018). Hilliard (2010) stated that early student involvement in leadership activities will help them have a positive attitude toward
the self, community, workplace, and social life. According to the Society for Human Resource Management, leadership competencies and skills contribute to superior performance and are a prerequisite in the 21st-century workplace (Ledford & Williams, 2018). Developing effective leaders relies heavily on clear and concise competencies that are communicated and clarified through professional development, higher learning programs, or at school district levels (Dunlap, Li, & Kladifko, 2015; Welch & Hodge 2018; Wilhite et al. 2018).

The role of education today needs to move past the procedural portion of learning and enable students to manage real-life problems and challenges in work and life by using several skills including leadership and its elements (Muammar, 2021). It is becoming increasingly vital for schools to prepare and send students out into the marketplace with the skills to be successful, not only academically but more importantly psychologically. Employers are increasingly searching for graduates with the ability to communicate, collaborate, and problem solve that in turn show beneficial for self-efficacy (Dunbar et al., 2016). A research study looking at the effects of leadership on 378 7th grade students in China identified that allowing students to take on leadership roles and skills developed confidence and self-efficacy (Anderson & Lu, 2017). Ideal student leadership models are inclusive rather than exclusive, the benefits of student leadership models accrue only to those who are directly involved in them.

In training and development of leadership in a school capacity, much needs to be considered. Policy, systems, and practices of student leadership may be understood in the relation to the four spheres of the domains of the classroom, the school, the school system, and the community (Black et al., 2014). Therefore, it is not enough to just offer a
leadership curriculum, but instead, it must be adapted by the entire school for effectiveness. Research has reported the impact of training programs on leadership skills; with results showing a positive impact, and interpersonal communication and speaking skills increasing significantly (Chan, 2000). Training students to be effective leaders will improve their employability and career development (Muammar, 2021), extending the importance and value of leadership training in schools.

**Digital Portfolios**

Performance assessments in learning exist in numerous structures in the classroom, including the opportunity for students to share their understanding and learning with a digital portfolio. Portfolios are not new, as they have been used in other fields for years, with artists, models, and architects using them to generate a sample of their skills. A digital portfolio is a multimedia collection of a student's work that can be stored and assessed on a digital platform (Milman, 2014; Niguidula, 2005; Tezci & Dikici, 2006). A distinctive characteristic of a portfolio is the position of the creator of the portfolio in the sense that they are both the assessor and assessed (Tezci & Dikici, 2006). A portfolio is meant to be goal-driven, with the contents, organization, and presentation of materials depending on the audience, purpose, demonstration, and type (Woodward, 2000; Milman, 2014). Meaning is what drives the content, so it is important if using a portfolio, the vision, purpose, audience, assessment, technology, logistics and culture have been considered to ensure meaningful transfer of learning and mastery (Niguidula, 2005). A Great deal must be considered when developing a portfolio to ensure the transfer of learning for a student.
Digital Portfolios’ Implications on Student Learning

The strategy of using a digital portfolio for students' learning can provide for several different purposes including assessment, reflection, sharing, goal setting, or collaboration (Woodward & Nanlohy, 2004). The implications of a student’s learning using a digital portfolio will determine how the portfolio will be created, what specific tasks or items will be included, and what outcomes the learner and teacher are trying to obtain. For this purpose, it is reasonable to review the literature on studies that attempt to understand the consequences of using digital portfolios.

The literature identifies studies set out to better understand the effectiveness of using a digital portfolio in the areas of talking about learning, student voice, narratives, student writing, teacher and student reciprocal learning, and students’ perceptions of their usefulness of them (Woodward, 2000; Tezci & Dikici, 2006; Wall et al., 2006; Hunt et al., 2006; Kilban & Milman, 2017; Knauf & Lepold, 2021). Woodward (2000) has been researching the influence of portfolios across multiple educational environments, with this study identifying the necessity of a framework and a place for children to have a place in the process. The idea of allowing the student a place in the decision-making can be controversial for some. A recent study in Germany examined the claim that attentively listening to children’s voice is an important pedagogical goal and used digital portfolios as a tool to give the students voice (Knauf & Lepold, 2021). Results of this study summarized that digitalizing participation using a portfolio did not inherently increase student voice, but more so the pedagogical strategies enabled the participation, stating that both work in tandem with each other (Knauf & Lepold, 2021). Wall et al. (2006) explored students’ perspectives within a digital portfolio project. They found asking
pupils how they learn was valuable in informing the development of innovations. More importantly, the study demonstrated the way multimedia can facilitate children’s talk about their learning (Wall et al., 2006), which again supports a constructivist view of intellectual involvement of the learner and engaging students to understand their learning from a deeper perspective. Hunt et al.’s (2006) discussion of digital portfolio development naturally involved the learner allowing them to pick and develop the software for their portfolios. Findings from the study reported that the benefits of the portfolios allowed students to manipulate and demonstrate mastery (Hunt et al., 2006), asserting the advantage of using a digital portfolio for students to express understanding of a topic.

Inside the context of a growth mindset, Hopper (2012) conducted a study hypothesizing that a digital portfolio could be used to improve reflective and critical thinking based on growth mindset training. Results from the study showed that students who developed a growth mindset would intuitively reflect on work, take feedback, and take on challenges, which in turn will enhance the effectiveness of a digital portfolio (Hopper, 2012). While using a digital portfolio to process and better understand growth mindset, in turn, students can also find the tools to work through the process of a portfolio more effectively. Singer-Freeman & Bastone (2017) compared students’ responses to a growth mindset intervention using both ePortfolios and handwritten assignments using a growth mindset intervention as the assignment. Concluding, that ePortfolios add value to assignments and intend to evoke personal reflection while applying core concepts to self. More recently it has been found that students who do
engage in ePortfolios in terms of choice, layout and content experience a shift in mindset, a can do attitude towards learning (Zuba Prokopetz, 2022)

Both the teachers and their students showed positive results reflecting comprehension, reflective process, and assessment (Kilbane & Milman, 2017). While each result can take on a different meaning, the content and process of digital portfolios are effective and impactful on the users.

**Chapter Summary**

Self-Efficacy and growth mindset theories are a clear influence on a student’s ability to reach goals. Within the capacity of self-efficacy, the behavioral patterns of a learner rely heavily on the belief in what they can achieve (Bandura, 1977,1982,1989). Students who are taught to attribute self-efficacy to effort perceived greater progress, with Schunk and colleagues (1987) a direct connection to efficacy beliefs and higher motivation, and progress for further learning. Growth mindset goes on to support the belief that the development of a student’s mindset to that intelligence is malleable and with effort and grit, you can achieve your goals (Dweck, 1995,1999, 2006), naturally aligns with supporting the increase of self-efficacy through a growth mindset innovation. Equipping students with a growth mindset can have a powerful effect on a student’s learning. The idea that brain functioning, and intellectual abilities are malleable has captured the public attention in recent years, leading many schools and districts to administer growth mindset interventions (Miller, 2019), with benefits outweighing risks. Research has looked at how and when learning occurs, with a constructivist learning environment having the teacher facilitate and the students taking control of their learning using previous knowledge (Brown, 2014). Therefore, making equally important the connection of using a digital
portfolio to support student learning of growth mindset, showing that digital portfolios allow learners to develop their voice and create a learning experience that is personal to them.
CHAPTER 3

METHOD

The purpose of this action research is to implement and evaluate the impact of a growth mindset innovation among middle school students aimed to improve and develop self-efficacy using a digital working portfolio. The two questions that guided this innovation study were (a) How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course? and (b) What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset innovation?

Research Design

This study assessed information about the growth mindset innovation impact on middle school students’ self-efficacy in a teen leadership course using a digital portfolio. An action research approach was the most appropriate for this study. Conducting action research has proven in educators’ circles to be a more manageable task that brings about results that are informative and have a direct application (Mertler, 2020). The action of research in the world of education is not uncommon in an informal manner, but with action research, we do it more consciously and purposefully to work on a problem to solve in education (Levin, 2006). The straight implications of the action research design on middle school students helped to inform processes for future lessons and help support student success.
Through the lens of mixed methods, the action research looked at quantitative and qualitative data to draw from the strengths of both types of research and minimize the weaknesses (Johnson & Onwuegbuzie, 2004). A major argument in favor of a mixed-methods approach in education is that it proved a rationale for hypotheses, theories, guiding assumptions, and presuppositions to contend with each other and provide alternatives (Niaz, 2008). According to Creswell, there are three core mixed methods designs: convergent, explanatory sequential, and exploratory sequential; this action research focused on the convergent design (Creswell & Creswell, 2018).

Mixed methods have several advantages according to Wisdom and Creswell, including compares quantitative and qualitative data, reflecting on participants' points of view, fostering scholarly interaction, providing flexibility, and lastly collecting rich and comprehensive data (Wisdom & Creswell, 2013). With the approach to the research being a collection of quantitative data and the qualitative data separately and simultaneously then merged and interpreted to compare results (Mertler, 2019), the convergent method fit best for this research model.

Historically, quantitative research landed as far back as the ideas of Plato and Socrates singular or universal truths, while qualitative was connected to the Sophists and the thought of multiple relative truths (Johnson et al., 2007). The mixed methods research landed in between those two extremes attempting to respect the wisdom of both viewpoints while seeking a solution (Johnson et al., 2007 p.4). Mixed methods allow the opportunity for all aspects of the research to be looked at to compare, contrast and solidify an argument for results. For example, in my research, if I had only conducted the quantitative, I would have only known that growth mindset influenced self-efficacy
growth. Yet, by adding the qualitative piece of the study design, I was able to observe and receive feedback from interviews to also describe the relationship between self-efficacy with a growth mindset and student success.

**Setting and Participants**

This study took place in the largest public school system in SC and the 44th largest in the nation with roughly 76,000 students. Specifically, this study took place in one of the twenty middle schools in the county with the 2020-21 school year profile putting student population around 1,125 and classroom averages running between 24-28 students per classroom. The student-to-teacher ratio was higher than the state average (i.e., 17:1 ratio). The school was built in 1955, and about 75% of the building was original. The school placed in the top 20% of all schools in South Carolina for overall test scores with math in the top 20% and reading proficiency in the top 30% for the 2018-19 school year.

In SC, the average free or reduced lunch was 62%. At the research school, the average was 16%. The population demographics academically showed students proficiency in math at 69%, 26% above the state average. The minority enrollment of students was about 10% lower than the state average. The school had a one laptop-for-every student (i.e., one-to-one) technology opportunity for each student. Laptops were distributed at the start of the year to each student with a technology support person on staff to support technology issues and needs. The research took place during classroom time in the building during regular school hours, using the provided Chromebook laptops loaned to the students.

The study approved by the University of South Carolina (see Appendix A) focused on a population of students from the 7th grade that either selected the Teen
Leadership class as an elective or were placed in the course by school administration. There were four sections of Teen Leadership offered at the school, two of which were taught by the researcher. For data purposes, the fourth and third period class participated in the innovation due to the lack of diversity in the third period class section. There were 42 students enrolled in both sections; however, there were only 23 active participants in the research (see Appendix B for consent form). Fourteen of the 23 students identified as female and nine as male. Sixty-five percent of the class identified as White, 27% were Black, 4% were Hispanic, and 4% identified as Asian or two or more races. Twenty-four percent of the student population received free or reduced lunch, and 21% of the student population held individual education plans (IEP) or 504 records.

Interview participants consisted of 13 out of the 23 student participants. From the students who participated, eight of the 11 students were female, and the other 3 identified as male; 64% identified as white, and the other 36% identified as Latino or Asian; 18% of the students were English as a Second Language Speaker; and finally, 27% of the students were supported with an IEP or 504. Table 3.1 displays the demographics of the interview participants.

Table 3.1 *Summary of Interview Student-participants*

<table>
<thead>
<tr>
<th>Interview Student Participants</th>
<th>Gender</th>
<th>Ethnicity</th>
<th>English Second Language Speaker</th>
<th>Student with IEP/504</th>
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<tbody>
<tr>
<td>Student 2</td>
<td>F</td>
<td>White</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Student 6</td>
<td>F</td>
<td>White</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Student 7</td>
<td>M</td>
<td>White</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Student 8</td>
<td>M</td>
<td>White</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Student 14</td>
<td>F</td>
<td>Hispanic/Latino</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Student Participant</td>
<td>Gender</td>
<td>Ethnicity</td>
<td>English Second Language Speaker</td>
<td>Student with IEP/504</td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>-------------</td>
<td>----------------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Student 16</td>
<td>F</td>
<td>White</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Student 17</td>
<td>M</td>
<td>Asian</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Student 19</td>
<td>F</td>
<td>White</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Student 23</td>
<td>F</td>
<td>Hispanic/Latino</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Student 27</td>
<td>F</td>
<td>White</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**Innovation**

For over a decade growth mindset has been researched and examined within the confines of K-12 education and academic achievement. Interventions with students including a longitudinal study and intervention by Blackwell et.al (2007) showed significant connections to an upward trajectory in grades, but more importantly promoting an incremental theory seemed to affect the increase of motivation (p.258). As middle school-aged students are navigating the new environment, each student tends to experience each moment in their way, constructing effective or ineffective adaptations in academics. A student’s self-beliefs have been shown to have a significant influence on academic ability (Dweck, 2006; Burnette et al. 2019). Most research has focused on effort, motivation, and student performance in academic areas. The specific innovation in this research was Brainology®, a research-based program that boosts students' intrinsic motivation by teaching them that their brain is malleable and up to them to develop, using the research from Dweck and associates. During the innovation students were presented with content in video platform as whole group for each module. Then students would be given the digital workbook in Google Classroom to process their recent learning from the
module. After the entire module was completed, students would then move to their digital portfolios to express their learning with the intent of sharing and teaching the concepts to others. The study intended to identify a relationship between developing a student’s growth mindset using a digital portfolio and its impact on a student's self-efficacy in a middle school leadership course.

**Digital Portfolio**

For this innovation, a digital portfolio was chosen to support student-centered instruction. A digital portfolio sometimes referred to as an electronic portfolio (EP), is a digital container storing audio and visual content such as text, images, video, and sound, but may also be a software tool to organize content (Abrami & Barrett, 2005). This platform was relevant to our study because it applied a constructivist learning theory that allows the learner to create their understanding of knowledge through experiences as related to prior knowledge, with a digital portfolio allowing to support a variety of pedagogy.

A working digital portfolio has the potential to facilitate reflection and innovation with students learning. Walls et al. (2006) examined the use of digital student portfolios as an instructional, assessment, and evaluation tool, with findings supporting digital portfolios. The study concluded first, that asking the students how they learn and about a process proved valuable. Second, the digital portfolio facilitated children’s talk about learning, and lastly potentially supported the creation of independent learners responsible for their achievements (p.217). Academic success factors according to behavior change theory are grouped into 3 areas: (1) teaching and learning, (2) environmental, and (3) socio-psychological factors, with collaboration, active learning being key components.
Below in Table 3.2, the benefits of using a digital portfolio are listed. The portfolio keenly engaged these key components by allowing the students to practice their learning by building a google sites page to collaborate and share their understanding.

Table 3.2 Advantages for Using a Digital Portfolio

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Application of Digital Portfolio</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student-centered Learning</td>
<td>Gives students the choice to use previous knowledge to build understanding.</td>
<td>Students create and develop a webpage as they develop and learn about growth mindset to share-out growth.</td>
</tr>
<tr>
<td>Reflection</td>
<td>Talk about what they are learning</td>
<td>Written journal prompts after lessons to process learning.</td>
</tr>
<tr>
<td>Assessment</td>
<td>The teacher can observe learning as it is happening</td>
<td>Slowly build a portfolio with a rubric and</td>
</tr>
</tbody>
</table>

Module Phases

Each module was conducted during class time on Tuesdays and Thursdays for a total of 10 weeks with 20 sessions and each session lasting approximately 40 minutes each. The module activities (see Appendix H) were part of the classroom grade for only a minor grade as defined by the county school rating expectations. The final digital portfolio project of the innovation was counted as a major grade as determined by the county school rating expectations. The innovation took place alongside the LeadWorthy content to create an enriching learning environment that will support leadership skills including self-efficacy and mindset. While working with at-risk youth, Flip Flippen saw a need for a program to help create meaningful relationships between adults and youth.
The program was developed to improve student-teacher relationships but has expanded to include another program previously called Teen Leadership, now called LeadWorthy. These concepts are touched on within the curriculum but do not go as in-depth as the intervention piece. The intervention modules were purposefully planned around the LeadWorthy content to make connections between leadership and growth mindset.

**Data Collection**

Using a mixed-methods approach in this study, data was collected from both quantitative and qualitative collection techniques. Quantitative data was collected in the form of a survey and documents and records. All data was stored on a Google Classroom for Education database with password protection. During the innovation, qualitative data was also collected in the form of interviews, and existing documents and records. Throughout the collection period and analysis, the researcher did not disclose or release information that would cause harm or exploit participants (Creswell, 2018). Below in Table 3.3, the alignment of research questions and collection methods from the study are presented.

Table 3.3 *Research Questions and Data Sources*

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Data Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course?</td>
<td>• Student Digital Portfolios</td>
</tr>
<tr>
<td></td>
<td>• Speaking Self-Efficacy Survey (Pre and Post)</td>
</tr>
<tr>
<td></td>
<td>• Mindset Assessment Profile tool (Pre and Post)</td>
</tr>
<tr>
<td></td>
<td>• Observations</td>
</tr>
<tr>
<td>Research Question</td>
<td>Data Sources</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| RQ2: What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset innovation? | • Observations  
• Interviews  
• Student Digital Portfolio (including Journal entry questions) |

**Interviews**

Conducting interviews was an important part of data collection to help better understand the perceptions of the participants in the study. Interviews can be conversations that are structured, semi-structured, or open-ended (Adams & Lawrence, 2019). The focus of the interviews with students was to identify perceptions of how a growth mindset supports self-efficacy for students in a leadership course with speech components. The purpose of individual interviews is to ask questions in a location and environment that is safe and allow participants opportunities to provide accounts, rationales, explanations and justification for their actions and opinions (Tracy, 2013).

The interviews were semi-structured to enable the opportunity for clarifying and probing questions (Mertler, 2020). Interviews took place with the participants during and after the intervention. The interviewees were the students that participated in the intervention. The interviews were group sessions during class time to capture information about their perceptions of growth mindset concerning self-efficacy and public speaking. Four to five participants were chosen at random for each interview. Due to using class time for interviews, each interview was five to ten minutes long and scheduled into the daily agenda. All interviews were recorded on the researcher’s school
issued laptop using the application Zoom with recording and transcribing functions. The transcription was stored in iCloud and accessed on a computer.

Questions for the interviews (see Appendix C) were directly aligned to research questions helping the researcher identify trends and themes from the participants. The research question alignment table for the interview portion is shown below in Table 3.4.

Table 3.4 Interview Question Alignment

<table>
<thead>
<tr>
<th>Research Question</th>
<th>Interview Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>RQ1: How can a growth mindset intervention using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course?</td>
<td>1. What types of digital learning have you used in school? For example, Google Slides, or Google Sites?</td>
</tr>
<tr>
<td></td>
<td>2. How has learning about a growth mindset supported your confidence in being a leader and using leadership skills such as public speaking? Give me an example of a time you have seen this.</td>
</tr>
<tr>
<td></td>
<td>3. When developing your digital portfolio, what were some activities and/or assignments that supported you to better understand growth mindset and how it works with developing your leadership capacity?</td>
</tr>
<tr>
<td>RQ2: What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention?</td>
<td>1. How confident are you with giving speeches in front of your classmates?</td>
</tr>
<tr>
<td></td>
<td>2. Have you heard of Growth Mindset before coming to this class?</td>
</tr>
<tr>
<td></td>
<td>3. Do you feel more confident with giving a speech in front of the class after learning about growth mindset?</td>
</tr>
</tbody>
</table>
Research Question | Interview Questions
-------------------|--------------------------------------------------
Give me an example of when you felt confident?  
4. When developing your digital portfolio, what were some activities and/or assignments that supported you to better understand growth mindset and how it works with developing your leadership capacity?  
Give me an example?  

**Speaking Self-efficacy Survey**

Students completed the Speaking Self-efficacy Survey (see Appendix E) to measure the levels of self-efficacy each participant has before the innovation and after the innovation is complete. The reliability of the questionnaire was calculated using Cronbach’s alpha consistency. In order to design the speaking skills self-efficacy beliefs questionnaire items were adapted from questionnaires by Rahimi and Abedini (2009), Gahungu (2007), Wang et al. (2013), and Saeidi and Ebrahimi Farshchi (2012), with an internal consistency of $\alpha = 0.84$ (Asakereh & Dehghannezhad, 2015). The presurvey was completed within the first week of the innovation to best gauge the initial levels of self-efficacy of the students participating in the research. Postsurvey was administered in the final week of the innovation. Data were stored in Google Education Applications by using a Google Form for both the pre-and-post surveys. Sherer and Maddux (1982) constructed and validated the original Self-efficacy Scale (SGSE) starting with a 14-point Likert scale ranging from “strongly agree” to “strongly disagree” with 36 items on the original version, which was reduced to 23 after determining the optimal number of
interpretable factors. Cronbach alpha reliability coefficients of .86 and .71 were obtained for both the general self-efficacy and social self-efficacy subscales (Sherer & Maddux, 1982), with similar results in organizational research across the world (Chen et al., 2009). In 1997, Chen and Gully developed an eight-item NGSE. Some items were new and some were carried over from the previous survey.

Students responded using a five-point -type scale from “strongly agree (5)” to “strongly disagree (1)” including statements such as, “I can deliver an organized speech (Item 3)”, “The more difficult the speaking practice is, the more enjoyable it is”, and believe I can succeed at most any endeavor to which I set my mind (Item 6)”, and “I can grab the audience’s attention at the beginning of my speech (Item 10)” (Asakereh & Dehghannezhad, 2015).

**Mindset Assessment Profile Survey**

Along with the Speaking Self-Efficacy survey, students also completed the Mindset Assessment Profile (MAP) tool (see Appendix F). This tool was supplied in the Brainology Foundations Curriculum from MindsetWorks Inc. and developed from the research of Dweck and team extensive research around implicit personality theory as a quick diagnostic tool to identify growth and fixed mindset (www.mindsetworks.com). The eight-item questionnaire developed by Mindset Works Inc. asks four questions that measure fixed mindset and four questions that measure growth mindset. The results land the participants in quadrants of levels of fixed mindset and growth mindset. An example of a few of the statements in the survey are, “You can learn new things, but you cannot really change your basic level or intelligence”, and “I like work that I will learn from even if I make a lot of mistakes”. According to recent results from a reliability and
validity study on the survey, the Mindset Assessment Profile reliability is (α=.63), using Cronbach’s alpha to determine reliability (Burgoyne & Macnamara, 2020). The MAP tool will be completed at the start of the innovation and again at the conclusion of the innovation to identify growth and to compare with other survey data. All MAP tool data was sent via email and completed in Google Form format with data exported to Excel for analysis in JASP.

**Documents and Records**

In the intervention module, the data that were submitted such as projects, assignments, reflections, and responses, these documents will be analyzed for themes and patterns. Specifically, in (see Appendix E) innovations, embedded within the Brainology curriculum are journal prompts that were collected in the journal portfolio. Some examples of journal prompt in the curriculum are: “How much effective effort have you put in learning a new thing? Use the language for the rubric in your explanation?”, or “In the situation described on the previous page, what could you have done differently to get a better outcome? Think about the growth mindset choice.” These were added to the digital portfolio and accessible by the researcher. Records and documents include confidential information such as school or medical records, that can be accessed only if consent is given by an individual or institution (Adams & Lawrence, 2019).

In the case of this research, the consent came from the school district and parents and guardians. Observation notes were also created during the research period using analytical memos both during and after data collection. These observations were used to identify themes and patterns. The observations took place during class time, specifically during speeches or presentations and were informal. The behaviors I was looking for
during the innovation students were completing an overarching project called a digital portfolio; this was developed over time on Tuesdays and Thursdays during class time using Google Sites. Each assignment aligned with the Brainology curriculum with some of the assignments being simple reflections or responses.

**Data Analysis**

In this action research study on the impact of a growth mindset innovation using a digital portfolio on middle school leadership students’ self-efficacy, data analysis focused on qualitative and quantitative data. The analysis for the research questions used thematic analysis, descriptive statistics, and paired samples $t$-tests as seen in Table 3.5 below.

**Table 3.5 Research question alignment table**

<table>
<thead>
<tr>
<th>Research Questions</th>
<th>Data Sources</th>
<th>Data Analysis</th>
</tr>
</thead>
</table>
| RQ1: How can a growth mindset intervention use a digital portfolio support self-efficacy improvement in middle school students taking a leadership course? | - Student Digital Portfolios  
- Speaking Self-Efficacy Survey (Pre and Post)  
- Mindset Assessment Profile tool | - Qualitative: Thematic analysis  
- Quantitative: Descriptive and inferential statistics |
| RQ 2: What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention? | - Journal  
- Interviews  
- Student Digital Portfolio (Journal entry questions) | - Quantitative: Descriptive statistics  
- Qualitative: Thematic analysis |
Qualitative Analysis

The qualitative data were collected from interviews and focus group formats, as well as journals and digital portfolio data. Each format added value and depth to a better understand the impact growth mindset potentially has on student-participants self-efficacy. Throughout the coding process obtained from the systematic method of a constant comparative method was used to compare the data applicable to each code and modify code definitions as new data is analyzed (Tracy, 2013 p.190).

Interviews were conducted with 7th-grade participants during class time. The interviews were recorded using a digital recording application called Zoom that can record, download, and transcribe. Transcripts were then loaded into a qualitative analytics program called Delve. The action research approach allows an inductive analysis to help reduce the volume of information organize data into patterns and themes to construct a framework (Mertler, 2020), and Delve helped with these steps. Developing a system of categorization which is used to group data that provide similar types of data is called a coding scheme (Mertler, 2020). This program allowed me to enter coded transcripts, organize interviews from each research question, and allow for memoing and willowing of data. Focus groups followed the same iterative method as interviews, as they were conducted in the classroom during school hours, recorded, and transcribed. The data from the focus groups were added to Delve qualitative analysis tool as a coding system, identifying themes and patterns from working within the program. Open-ended responses allowed data to be collected from the 7th-grade student-participants.

A full description of the qualitative data analysis is described in Chapter 4.
 Quantitative Analysis

For the quantitative analysis portion of the research, the analysis used JASP. With this tool, the descriptive statistics were calculated and the pretest and posttest scores of survey data were also analyzed. The alpha level was set at 0.05 as this is typical for most educational research studies and indicates that we can reasonably be certain that only 5% of the time would the difference we obtain be by chance (Mertler, 2020 p.187).

A full description of the quantitative analyses is described later in Chapter 4 with the findings.

Rigor & Trustworthiness

In this study, it was important to keep integrity throughout the process. While collecting, analyzing, and presenting data, I used thick rich descriptions, triangulation, member checking, and peer briefing.

Thick Rich Description

Using high-quality methods embedded in the qualitative piece of the study allows information to be abundant. A thick detailed description can be an important provision for promoting rigor and trustworthiness as it helps to describe the situations and paint a picture of the context around the researcher (Shenton, 2004). When researchers use a thick, rich description to detail the setting of their research and offer multiple perspectives the results can add validity to the findings in the study (Creswell, 2018).

In this study, I used the settings and participant section to describe in detail what the study will look like for the research as well as for the participants. I have also described specifically who the participants will be in this study. As the study developed,
we had more information to create a deeper perspective on the context of the research and those pieces will be added.

**Triangulation**

The use of multiple data sources, methods, and sources to collect data can increase trustworthiness in a study, better known as triangulation (Mertler, 2020). It is important to examine evidence from multiple sources to allow you to join perspectives from participants and data to help validate the study (Creswell, 2018). In this study, data was triangulated from the quantitative data and qualitative data collected using a convergent mixed method.

Data sources in the qualitative study were interviews, journals, and focus group data. These three sources will be analyzed using a qualitative data analysis program to allow ease of triangulation of multiple documents and transcripts. The ability to look at multiple sources will help indicate contradictions or patterns and themes that could be emerging in the research process. Quantitative data sources are the surveys, documents, and records, and are addressed in the data collection section of this research.

**Member Checking**

In the qualitative study, the participants were actively involved in a growth mindset innovation using a digital portfolio with online and classroom activities. The member checking process of asking participants who are directly involved in the study to review accuracy is a purposeful piece of the data collection process (Mertler, 2020). Quantitative survey results were shared with students, one student shared their results and was asked if they were surprised by the results. This student was aware of her growth in Growth Mindset but was surprised that her self-efficacy scores had increased (Student 2).
The online pieces of the process will be the culminating project using a digital portfolio with weekly assignments from the participants. This time allowed me to take themes, reports, and descriptions back to the participant to see whether these participants feel they are accurate (Creswell, 2018). There was a closing interview for all the participants as well during the research process where member reflection questions were asked to participants. These questions were formed in a way that allows the participants to give an opinion and shape the emerging analysis (Tracy, 2013).

**Peer Debriefing**

In our program, a committee chair has been appointed to us for an audit at multiple steps in writing our dissertation. The procedure of having an external auditor can provide an objective assessment of the research and can enhance the strength of the study (Creswell, 2018). Peer debriefing is the process in which an expert or peer reviews prepared work and asks questions to the researcher to help see the research from a different interpretation than that of the researcher (Creswell, 2018). Dr. Grant, my committee chair from the university, completed this process with me. We met during multiple sessions, first looking at my analytical and evaluation techniques. In a proceeding meeting we discussed coding processes and organization. Moving to creating an outline, Dr. Grant helped identify areas that need more details and descriptions as well as gaps in student perspectives. This process happened throughout the quantitative and qualitative analytical dissertation process successfully and was given constructive feedback that added value to the research.
Sharing and Communicating Findings

The purpose of the action research is to identify a growth mindset as a purposeful attribute for supporting self-efficacy in 7th-grade students in a leadership course. The research was conducted within a local middle school situated in one of the largest school districts in the state of South Carolina, collecting data from a student participating in innovation of growth mindset using a digital portfolio. Throughout the research period, findings were shared with students, administration, and participants’ parents in the intervention. We created action items related to growth mindset and follow the results from those action steps during our classroom time together. Member checking is an opportunity to review the raw data and adequately represent the beliefs and perspectives of the participants (Mertler, 2020).

Once the research concluded, the findings will be shared to the public, as well as with stakeholders from the administration down to the level of students. The researcher will schedule a meeting with the school administration, and the findings were shared in person during traditional school hours and after hours. I will discuss with the administration the possible benefits of my findings and how they can extend through schools and classrooms to create a more effective environment for students.

Moving outside of the district setting, it is also significant that research findings reach a broader audience with results being submitted to be published in educational technology peer-reviewed journals such as *ITET, Innovations in Education*, and *TechTrends*. Educational conferences are also an opportunity to share findings, with a majority of these conferences offering a virtual platform to share with the general public to support change and innovation with ISTE and FETC conferences as well as others.
CHAPTER 4
ANALYSIS AND FINDINGS

The purpose of this action research was to implement and evaluate the impact of a growth mindset innovation among middle school students aimed to improve and develop self-efficacy using a digital working portfolio. The two questions that guided this innovation study were (a) How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course? and (b) What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset innovation?

This chapter offers an overview and analysis of the data collected during a mixed-methods action research study. 23 7th-grade student-participants took part in this study. These students were administered pre-and-post surveys. They also took part in interviews, innovation activities, and reflections. This chapter includes both my quantitative findings and qualitative findings. Incorporated in the quantitative findings are descriptive and inferential statistics. In the qualitative section, participant experiences, participant observations, participant experiences with the study, and themes and my interpretations from my data can be found.

**Quantitative Findings**

Quantitative data were collected in the study using two validated surveys. Students completed the Speaking Self-efficacy survey, along with the Mindset Assessment Profile (MAP) tool. Data were analyzed using the free open-source
MAP Tool Survey

To identify and measure a student's growth and fixed mindset, students were administered a pre-and-post version of the MAP tool. This tool was supplied in the Brainology Foundations Curriculum from Mindset Works Inc. and developed from the research of Dweck and her team’s (Dweck & Leggett, 1988; Dweck, Chiu, & Hong, 1995; Dweck & Yeager, 2019) extensive research around implicit personality theory as a quick diagnostic tool to identify growth and fixed mindset (www.mindsetworks.com). The eight-item survey developed by Mindset Works Inc. asked four items that measured fixed mindset and four items that measured growth mindset using a 5-point Likert scale. Each item was scaled as: (1) Strongly disagree (2) Disagree, (3) Slightly disagree, (4) Slightly agree, (5) Agree, and (6) Strongly agree. The four fixed mindset items were reverse coded so that higher scores indicated positive change. In addition, I conducted an internal consistency analysis on the postsurvey values. Cronbach’s alpha reached a reasonable reliability with $\alpha = 0.60$.

Overall MAP Tool. The descriptive statistics for the student participants ($n = 23$) for the MAP tool questionnaire were calculated from the presurvey and postsurvey data. Questionnaires were given to the students in Google Form format. Data were downloaded into an Excel spreadsheet to summarize the totals of each participant’s responses for both the pre- and postquestionnaire. The mean response of each survey and its standard deviation were calculated using JASP software and are represented in Table 4.1. Pre- and-post scores data indicated the mean for the presurvey scores for the MAP tool was
24.37 with a standard deviation of 6.24 while postsurvey data resulted in a mean of 25.45 with a standard deviation of 5.98. The means of the prescore were less than the mean of the postscore. A positive increase of 1.08 is a small area of increase moving the students’ mindsets from fixed to growth before and after the Brainology innovation.

Table 4.1 MAP Tool Descriptive Statistics (n=23)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presurvey</td>
<td>24.57</td>
<td>6.31</td>
</tr>
<tr>
<td>Postsurvey</td>
<td>25.39</td>
<td>6.10</td>
</tr>
</tbody>
</table>

To test impact of the innovation, a paired samples t-test was planned to compare overall prequestionnaire means to postquestionnaire means. The Shapiro-Wilk test was used to check normality of data, and the results indicated a normal distribution with \( p = .512 \) So, a paired t-test was conducted. While overall postsurvey had a mean score of 25.39, \((SD = 6.10)\) were higher than presurvey with a mean score of 24.57 \((SD = 6.31)\), the differences did not reach statistical significance with \( t(22) = -0.809, p = .22. \)

MAP Tool Results by Growth Mindset Subscale

Table 4.2 displays the descriptive statistics for the growth mindset subscale in the study. It is broken down by pre- and postsurvey data. An interesting point in this data is the increase of each individual growth mindset item. The descriptive statistics of the growth mindset subscale illustrates a mean score of 13.71 \((SD = 4.76)\) for the presurvey score, and a mean score of 15.61 \((SD = 4.69)\) for the postsurvey score. This is a sizeable increase from presurvey to the postsurvey.
Table 4.2  MAP Tool Descriptive Statistics Growth Mindset Subscale (n = 23)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presurvey</td>
<td>13.71</td>
<td>4.76</td>
</tr>
<tr>
<td>Postsurvey</td>
<td>15.61</td>
<td>4.69</td>
</tr>
</tbody>
</table>

To test the understanding of the subscale, a paired samples t-test was planned to compare growth mindset specific questions prequestionnaire means to postquestionnaire means. The Shapiro-Wilk test was used to check normality of data, and the results indicated a normal distribution with $p = .085$. So, a paired t-test was conducted. Overall, the differences did not reach statistical significance with $t(22) = -1.286$, $p = .11$

MAP Tool Results by Fixed Mindset Subscale

Table 4.3 displays the descriptive statistics for the fixed mindset subscale in the survey. The data were reverse coded. The descriptive statistics of the fixed mindset subscale calculated a mean score of 10.39 ($SD = 3.87$) for the presurvey score and a mean score of 9.78 ($SD = 3.16$) for the postsurvey score. Since a decrease in fixed mindset was preferred, the subscale showed a small decrease from presurvey to postsurvey.

Table 4.3  MAP Tool Descriptive Statistics Fixed Mindset Subscale (n = 23)

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presurvey</td>
<td>10.39</td>
<td>3.87</td>
</tr>
<tr>
<td>Postsurvey</td>
<td>9.78</td>
<td>3.16</td>
</tr>
</tbody>
</table>

To test the understanding of the subscale, a paired samples t-test was planned to compare fixed mindset specific questions prequestionnaire means to postquestionnaire means. The Shapiro-Wilk test was used to check normality of data, and the results
indicated a normal distribution with $p = .479$. So, a paired $t$-test was conducted. Overall, the differences did not reach statistical significance with $t(22) = 1.078, p = .29$.

**MAP Tool Results by Item**

Table 4.4 displays the descriptive statistics for each item in the questionnaire broken down by pre-and-post questionnaire data. An interesting point in this data is the increase of some of the individual item. Out of the eight items below, six of them increased or stayed the same. Item 3 showed the presurvey score of a mean score of 2.79 ($SD = 1.69$) and a sizeable increase to the postscore with a mean score of 3.42 ($SD = 1.56$).

Table 4.4 *MAP Tool Descriptive Statistics by Item (n = 23)*

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Presurvey M (SD)</th>
<th>Postsurvey M (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. No matter how much intelligence you have, you can always change it a good deal.</td>
<td>4.83 (1.13)</td>
<td>4.83 (1.34)</td>
</tr>
<tr>
<td>2. You can learn new things, but you cannot really change your basic level of intelligence</td>
<td>3.38 (2.00)</td>
<td>3.46 (1.74)</td>
</tr>
<tr>
<td>3. I like my work best when it makes me think hard.</td>
<td>2.79 (1.69)</td>
<td>3.42 (1.56)</td>
</tr>
<tr>
<td>4. I like my work best when I can do it well without too much trouble</td>
<td>1.54 (0.72)</td>
<td>1.71 (1.04)</td>
</tr>
<tr>
<td>5. I like work that I will learn from even if I make a lot of mistakes</td>
<td>3.71 (1.57)</td>
<td>3.92 (1.44)</td>
</tr>
<tr>
<td>6. I like my work best when I can do it perfectly without any mistakes</td>
<td>1.92 (0.88)</td>
<td>1.79 (0.83)</td>
</tr>
<tr>
<td>7. When something is hard, it just makes me want to work more on it, not less.</td>
<td>2.83 (1.66)</td>
<td>3.50 (1.62)</td>
</tr>
</tbody>
</table>
8. To tell the truth, when I work hard, it makes me feel as though I am not very smart.

3.38 (1.81) 2.83 (1.37)

Speaking Self-efficacy Survey

To better understand changes in self-efficacy because of the innovation, students were administered a pre-and-post Speaking Self-Efficacy survey compromised from two validated instruments. The final version of the survey contained statements from both Warren (2011) and Asakereh and Dehghannezbad (2015) and consisted of 20 items using a five-point Likert-type scale from 5: Strongly Agree to 1: Strongly Disagree. I conducted an internal consistency analysis on the postsurvey values with a Cronbach’s $\alpha = 0.92$.

The descriptive statistics for the student participants ($n = 23$) for the survey items were collected in a Google Form and downloaded into an Excel spreadsheet to calculate the sums of each student submission. The mean responses and their standard deviations were calculated using JASP software, and they are presented in Table 4.5. Pre-and-post scores indicated the mean for the presurvey was a mean score of 69.49 ($SD = 14.37$), while postsurvey data showed a mean score of 74.61 ($SD = 14.48$). The prescore was less than the postscore with a difference of 5.12 from the pre-and-post scores. A positive increase showed the students’ speaking self-efficacy increased after the innovation.

Table 4.5 Speaking Self-efficacy Survey Descriptive Statistics ($n = 23$)

<table>
<thead>
<tr>
<th></th>
<th>$M$</th>
<th>$SD$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presurvey</td>
<td>69.49</td>
<td>14.37</td>
</tr>
<tr>
<td>Postsurvey</td>
<td>74.61</td>
<td>14.48</td>
</tr>
</tbody>
</table>
Similarly, to the MAP tool, the Speaking Self-Efficacy survey was administered to test the impact of the innovation with a paired samples $t$-test to compare the pre-and-post scores. The Shapiro-Wilk test was used to check normality of data, and the results indicated a normal distribution with $p = .20$. Results of the paired $t$-test showed a significant difference from presurvey to postsurvey scores with $t(22) = -2.755, p = .006$. These results indicated the innovation had a positive effect on improving students’ speaking self-efficacy.

**Speaking Self-efficacy Results by Item**

Table 4.6 displays the descriptive statistics for each item on the Speaking Self-Efficacy both pre-and post-survey. For the most part, the student participants who took part ($n = 23$) increased their speaking self-efficacy. A point that can be made from the data is that most survey items shows an increase from pre- to postsurvey. This is interesting because the data shows growth of student participants self-efficacy in relation to speaking.

**Table 4.6 Speaking Self-efficacy by Item**

<table>
<thead>
<tr>
<th>Survey Item</th>
<th>Presurvey $M$ (SD)</th>
<th>Postsurvey $M$ (SD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I have enough ability to improve my speaking skills.</td>
<td>3.69 (1.10)</td>
<td>4.35 (.714)</td>
</tr>
<tr>
<td>2. I am sure that if I practice speaking more, I will get better grades in the course.</td>
<td>4.22 (0.95)</td>
<td>4.35 (1.03)</td>
</tr>
<tr>
<td>3. I can deliver an organized speech.</td>
<td>3.78 (1.04)</td>
<td>4.13 (0.97)</td>
</tr>
<tr>
<td>4. I can present an effective speech to classroom audience.</td>
<td>3.57 (1.12)</td>
<td>3.96 (1.11)</td>
</tr>
<tr>
<td>5. Even if the speaking task is difficult and I don’t have the required vocabulary, I can find the strategy to get the message across.</td>
<td>3.52 (1.2)</td>
<td>3.57 (1.16)</td>
</tr>
<tr>
<td>Survey Item</td>
<td>Presurvey $M (SD)$</td>
<td>Postsurvey $M (SD)$</td>
</tr>
<tr>
<td>----------------------------------------------------------------------------</td>
<td>-------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>6. The more difficult the speaking practice is, the more enjoyable it is.</td>
<td>2.4 (1.41)</td>
<td>2.57 (1.6)</td>
</tr>
<tr>
<td>7. When the instructor asks a question, I raise my hand to answer it even if I’m not sure about it.</td>
<td>2.35 (1.5)</td>
<td>2.78 (1.38)</td>
</tr>
<tr>
<td>8. While speaking, I can deal efficiently with unexpected situations.</td>
<td>3.00 (1.00)</td>
<td>3.48 (1.16)</td>
</tr>
<tr>
<td>9. I can maintain good posture during my speech.</td>
<td>3.48 (1.41)</td>
<td>3.87 (1.36)</td>
</tr>
<tr>
<td>10. I can grab the audience’s attention at the beginning of my speech.</td>
<td>3.09 (1.20)</td>
<td>3.83 (0.94)</td>
</tr>
<tr>
<td>11. I can maintain eye contact with my audience at least 90% of the time while delivering my speech.</td>
<td>3.35 (1.19)</td>
<td>3.65 (1.19)</td>
</tr>
<tr>
<td>12. I can make it clear that I am a credible speaker during my speech.</td>
<td>3.39 (1.12)</td>
<td>4.17 (0.78)</td>
</tr>
<tr>
<td>13. I can stop myself from fidgeting during my speech.</td>
<td>2.83 (1.4)</td>
<td>2.91 (1.24)</td>
</tr>
<tr>
<td>14. I can stay within the time limits assigned for my speech.</td>
<td>3.91 (1.00)</td>
<td>4.09 (0.95)</td>
</tr>
<tr>
<td>15. I can use gestures effectively during my speech.</td>
<td>3.48 (1.16)</td>
<td>3.61 (1.16)</td>
</tr>
<tr>
<td>16. I can end my speech with a conclusion that reviews my main ideas.</td>
<td>4.22 (1.00)</td>
<td>3.87 (0.97)</td>
</tr>
<tr>
<td>17. While speaking, I can remain calm when facing difficulties.</td>
<td>3.87 (0.92)</td>
<td>3.57 (1.24)</td>
</tr>
<tr>
<td>18. I’m confident I can communicate what I mean easily.</td>
<td>3.48 (0.95)</td>
<td>3.65 (1.23)</td>
</tr>
<tr>
<td>19. I’m able to actively participate in my speaking classes.</td>
<td>3.96 (1.07)</td>
<td>3.87 (1.01)</td>
</tr>
<tr>
<td>Survey Item</td>
<td>Presurvey M (SD)</td>
<td>Postsurvey M (SD)</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>20. I can discuss subjects of my interest with my classmates.</td>
<td>3.91 (1.13)</td>
<td>4.13 (1.01)</td>
</tr>
</tbody>
</table>

**Qualitative Analysis, Findings, and Interpretations**

I used student digital portfolios, surveys, journals, and interviews to obtain qualitative data for this study to provide a more in-depth look at my student participants’ perception, understanding and impact of a growth mindset innovation. The student pre- and post- interview recordings were transcribed verbatim in the students’ own vocabulary to ensure authenticity. The qualitative data sources included two student interviews, two reflection journals with a series of open-ended responses, as well as a survey with two open-ended responses and one multiple choice response. Table 4.7 shows a summary of the sources.

Table 4.7 Summary of Qualitative Data Source

<table>
<thead>
<tr>
<th>Type of Qualitative Data Source</th>
<th>Number of Documents and Transcriptions</th>
<th>Total Number of Codes Applied</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reflection Journal Assignment</td>
<td>7 open-ended free response questions/prompts.</td>
<td>146 codes applied</td>
</tr>
<tr>
<td>Interviews</td>
<td>9 open-ended free response questions/prompts</td>
<td>86 codes applied</td>
</tr>
<tr>
<td>Pre-Map Tools Survey Items</td>
<td>2 open-ended free response questions/prompts. One multiple choice question</td>
<td>29 codes applied</td>
</tr>
</tbody>
</table>
Analysis of Qualitative Data

Throughout the coding process an inductive and thematic method was used to compare the data applicable to each code and modified code definitions as new data were analyzed (Tracy, 2013). This method is a process of coding where the data is not forced to fit it into a preexisting coding frame or the researcher's preconceptions and therefore is data driven (Braun & Clarke, 2006) Data are compared to other data during the process of coding. This process begins with open coding to develop categories from the first round of data reduction and further reducing and recoding allows possible core categories to emerge (Fram, 2015). I used sentences as my unit of analysis. In vivo coding derives from the actual language of the participant. I picked this because of my constructivist grounded theory process of allowing the participants to say what needs to be said, then need to structure their own reality. When doing in vivo coding (or verbatim coding), you read through the data and name codes based on words and phrases utilized by the participant (Saldana, 2009). Each data source was put into transcript form and downloaded into the Delve qualitative analysis tool.

First Cycle of Coding

My process started with processing the transcripts. Using Zoom closed captions, I was given an already completed transcript, but they are typically riddled with mistakes, so I opened the transcripts and then played back the interviews to correct mistakes. While doing that, questions and ideas started to arise, helping me decide the best course of action to extract codes, patterns and themes from the data. My sources are the interview transcripts, and journal entries from the participants. My process for analyzing qualitative data was first looking organically at the transcripts and data by highlighting text segments
I noticed using Delve after uploading. As you can see in Figure 4.1, Delve was used to highlight.

![Figure 4.1 Highlighting Text Segments in Delve](image)

Once the highlights were completed, the next cycle was to see what codes appeared from the highlights. In the course of coding, more than one code may have come out from the same text. The data was reviewed many times, looking and re-looking for emerging codes (Moghaddam, 2006). In Figure 4.2 the emerging codes came from the sentences highlighted, particularly as similarities and patterns started arising in this first iteration. Presenting codes in a more organic manner from the start made it easier to keep a more flexible structure on the emerging patterns and themes, such as identifying negative, positive, and indifferent experiences with the innovation.
Second Cycle of Coding

The next iteration involved printing each code. This was done together without grouping into categories or themes, but instead to find and combine similar codes (see Figure 4.3). Some of the highlighted sentences shared codes with other areas and could sometimes have one to three different codes associated with student language. For example, a student responded about how “it” (growth mindset) gives them more confidence to where they think positive of themselves, this had three codes (1) be kind to myself, (2) GM-supported confidence in leadership/public speaking, and (3) think positively. Looking at them printed allowed me to group each coded sentence into a broader area of understanding.
In Figure 4.4, the starting process of cutting and organizing can be seen. I chose to first group under the research questions, first I grouped these on windows for a clear
visual. I am starting to notice categories within my codes, so I am starting to multi-code
my sentences to help the process. I was able to start physically looking at my data on
paper. I used Microsoft Excel to organize codes and snippets. I knew Delve had a system
for this, but for me and my process, Excel worked better for me. I put on the windows in
my summer room color-coded sticky notes with my research questions. I looked at the
snippets/codes from just the journal portion of my qualitative data. I used the
corresponding highlighter colors of the research questions under what research questions.
I then cut out and put on my vision board windows. From this point, I continued the same
process with the interview data. I then started to clip and paste codes from data with
already identifying a category and subcategory as I am pasting codes under designated
research questions. As I identified the categories, I found subcategories and attempted to
organize the codes in categories within Delve at the same time.

Figure 4.4 Second Iteration of Codes
This process was where my research came to halt, on July 23\textsuperscript{rd} at 10 am my research stopped. My husband and the father of my three sons passed away from a massive heart attack. I am adding this detail to my research as it had a profound impact on how I processed my data and moved forward in finishing my report of research. Ultimately, I would say that it pushed me to look at the data in a different space as I took a semester to mourn and came back with a more focused perspective. Data seemed a little bit easier and less cumbersome as I had a fresh outlook.

I started back with the second cycle of coding my qualitative data. In Figure 4.5, I moved the snippets to a more movable template by adding them to easel pad pages for visibility and processing. Using my research questions as a guideline (organically in the first iteration), I identified what the students were saying about the impact of the growth mindset curriculum using a digital portfolio, for example the pattern and theme that the actual digital portfolio had little impact, however identifying positive, negative and indifferent opinions. I also identified student perceptions and experiences. For instance, the identification of the innovation supporting stress. This iteration also allowed me to take notes and move around sticky notes and categories to organize my emerging themes and patterns. From this final iteration, I was able to identify clear themes that were emerging from the student responses. When the codes were categorized by research question, I attempted to categorize the codes using magnitude coding, detecting frequency to better understand the impact of the innovation on the student's growth mindset and self-efficacy (Saldana, 2009).
Figure 4.5 *Final Iteration of Codes*

I started to notice categories within my codes, so I multicoded my sentences to help the process. Then I was able to start physically looking at my data on paper. I looked at the snippets/codes from just the journal portion of my qualitative data using corresponding highlighter colors of the research questions to highlight and identify what snippets/codes went under which research questions. This began to become cumbersome, so I then moved to Delve to start organizing under the research question sections, as seen in Figure 4.6. This involved clipping and pasting codes from data into the emerging categories under the research questions. Some themes that were emerging were (1) the impact of the innovation is showing that the students learned strategies of growth mindset to help support their self-efficacy and (2) how students approach mistakes or take on new tasks.
Additionally, while coding was occurring both during the first and second iteration, several peer debriefing sessions took place with my dissertation chair. While first-and second-round coding were occurring, several peer debriefing sessions took place with my dissertation chair. These sessions involved analyzing codes and categories. Also, during these sessions, codes, categories, and themes were analyzed and reviewed for clarification while in Delve. Based on the peer debrief sessions and as analysis of the qualitative data progressed, some codes and categories were rearranged for better alignment with the overall themes.

An important part of understanding how a growth mindset intervention used a digital portfolio to support self-efficacy improvement in middle school students taking a leadership course begins with first identifying if students developed a growth mindset. The codes that subsumed this idea created Theme 1: The innovation developed students’ growth mindset. Supporting the identification of the students developing a growth mindset revealed themselves with students showing they were more comfortable with
making mistakes. Students also proved to be more aware of their fixed mindsets and changing them to a growth mindset. Lastly, students who at the start of the innovation did not understand growth mindset prior to the innovation now show understanding. The research asked about students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention, more so if self-efficacy improved from the growth mindset innovation, with codes creating Theme 2: Growth mindset strategies supported students’ self-efficacy in multiple school and classroom areas. Findings developed this theme from students expressing self-efficacy moving to support self-efficacy in public speaking with responses also stating that it allowed them to take on new tasks in other areas of the classroom and their life. For example, taking tests or speaking to peers.

However supportive the innovation was for self-efficacy; an indifference was also identified where students expressed no change in these areas. Codes surrounding these indifferences moved past self-efficacy and broadened to the whole of the growth mindset innovation developing Theme 3: Students' perceptions of the growth mindset innovation were both positive, negative, and indifferent. Analysis showed that students responded positively, negatively, and indifferently to journal prompts, as well as during the interview process. The digital portfolio was a component of the research to support the development of the growth mindset, interaction with this portfolio created Theme 4: Digital portfolios were designed to represent student knowledge, but students were impacted little by them. The findings for this theme were developed from responses from participants about their abilities to take on the task of a digital portfolio and their prior experience with digital platforms. Students expressed positive attitudes about their
abilities and experiences, and others reflected their inability as well. A category that also emerged surrounding this theme evolved from student interview responses stating a preference of paper or traditional learning, opposed to digital platforms. Lastly, in journals and interviews responses also identified students' perceptions of how the activities supported the understanding of a growth mindset, with most sharing little impact.

Themes and Interpretations

Four primary themes emerged from the analysis of the data (see Table 4.8). Prior to, during, and at the end of the innovations, students shared their perceptions of the impact of the innovation and this was reflected in areas such as (a) The innovation gave students a Growth mindset, (b) Growth Mindset gave strategies to students to support self-efficacy in multiple school and classroom areas, (c) correct methods with careless errors, and (d) Digital portfolios were designed to represent student knowledge, but students were impacted little by them. Each of these themes is explained in detail below.

Table 4.8  Theme and Categories

<table>
<thead>
<tr>
<th>Theme</th>
<th>Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme 1: The innovation gave students a growth mindset.</td>
<td>• Allows students to be more comfortable with mistakes.</td>
</tr>
<tr>
<td></td>
<td>• Aware of a fixed mindset but changed and used a growth mindset.</td>
</tr>
<tr>
<td></td>
<td>• Students who did not understand GM prior to innovation, now understand.</td>
</tr>
<tr>
<td>Theme 2: Growth mindset gave strategies to students to support self-efficacy in</td>
<td>• Supported self-efficacy in public speaking.</td>
</tr>
<tr>
<td></td>
<td>• Supported self-efficacy in school.</td>
</tr>
<tr>
<td></td>
<td>• Believe they are able to take on a new task.</td>
</tr>
<tr>
<td>Theme</td>
<td>Categories</td>
</tr>
<tr>
<td>-------</td>
<td>------------</td>
</tr>
</tbody>
</table>
| multiple school and classroom areas. | • Students share how they will use their growth mindset to support self-efficacy as well as other areas.  
• Believe it supported self-efficacy in managing stress and how to respond to a situation. |
| Theme 3: Students’ perceptions of the growth mindset innovation were both positive, negative, and indifferent. | • How the students perceive understanding the growth mindset helps.  
• Students share how they will use their growth mindset to support self-efficacy as well as other areas. |
| Theme 4: Digital portfolios were designed to represent student knowledge, but students were impacted little by them. | • Believe they are able to take on the task of a digital portfolio.  
• Prior experience with digital platforms  
• Preferences of traditional paper or digital platforms  
• Activities that supported understanding of growth mindset. |

**Theme 1: The innovation developed students’ growth mindset.**

Dweck (2000) described an individual with a growth mindset as someone who believes that intelligence can grow with perseverance and effort on challenging tasks, and thus, that struggle is an opportunity for growth, not a sign that a student is incapable of learning (Paunesku, 2015). Students’ responses from interviews, journal entries, and responses suggested that students developed a growth mindset within the innovation. The theme can be defined as students perceived to have developed a growth mindset from the innovation, expressing this through journal responses as well as during interviews. Interventions have shown that social-psychological or academic-mind-set interventions
(Farrington et al., 2012) have been influential. Studies in experimental psychology and economics conducted in the U.S. and Norway have investigated the effect of school-based interventions that shape pupils’ beliefs in their ability to learn they conclude that pupils who are taught that their intelligence can be developed through effort and dedication show more perseverance (Bettinger et al., 2016). Using the Mindset Works © Brainology innovation supported the students in developing a growth mindset.

The findings from this theme were developed from four categories: (a) students were more comfortable with mistakes; (b) students were aware of a fixed mindset but changed and used a growth mindset; and (c) students who did not understand growth mindset prior to innovation now understand.

**Students Were More Comfortable with Mistakes.** Being comfortable with making mistakes has been a key component of having a growth mindset. One of the guidelines for applying a growth mindset stated that students should embrace their mistakes and confront their deficiencies, along with effort and learning (Dweck, 2009). A student who is more comfortable with making a mistake can be defined as a student that does not allow a mistake to stop them from moving forward. The student understands that a mistake is what allows them to learn and grow, specifically using growth mindset strategies. My students expressed their comfort with mistakes since participating in the innovation.

During the interviews, the students responded positively towards their comfort with mistakes. For example, one student said, “I mean, I realized I don’t have to do everything perfectly. It’s okay to make mistakes as long as I just keep moving on, and
don’t let one mistake lead me into making another one” (Student 2, post focus group interview). Similarly, another student stated:

Yeah, I am okay with making mistakes now because before if I made a mistake, I would like, you know, like hide myself in the corner and like not want to talk to anyone. But like now, I know it's okay and now like everyone makes mistakes.

(Student 18, post focus group interview)

Particularly, this student noticed that her ability to make mistakes changed significantly from before the innovation. Being a clear indicator that the student was aware that her mindset had changed from fixed to growth. Another student also confirmed this category by responding:

Because of this class and everything, I've been like, “Oh, I've been better with making mistakes.” I still like struggle with it sometimes, but I'm a lot more like Okay, with making mistakes now. (Student 2, post-interview)

Both students recognized they have had a change in their mindsets, specifically in how they accept making mistakes.

However, there was discrepant evidence that did not support this theme, too. For example, one participant mentioned, “I think I’d hate it if I made a mistake, now, because I've been in this class for a long time, and I think if I made a mistake near the end of the year, that would be really embarrassing first of all, because I forget something.” (Student 14, post-interview). Another participant stated during the post-interview when asked about mistakes; “I've never really been good at public speaking, and I've known my growth mindset since I was 8, because of my dad, and it never really helped me, but it helps others.” (Student 27). Not all students identified that the strategies allowed them to
feel more comfortable with making mistakes, yet data from interviews mentioned mistakes 26 times in three different transcripts.

**Students Were Aware of a Fixed Mindset but Changed and Used a Growth Mindset.** Being aware of a fixed mindset but changed to and used a growth mindset can be defined as students showing an awareness of an event that they reacted to with a fixed mindset. From that awareness, students then changed to a growth mindset. A ‘fixed mindset’ is the belief that the ability to learn is a fixed trait and a ‘growth mindset’ is instead the belief that intelligence can be developed through effort and dedication (Foliano et al., 2019). Students were consistently able to identify moments of fixed mindset during the innovation process and then used growth mindset strategies learned to change the fixed mindsets.

In Unit Three of the innovation with lessons one and three, students were prompted to reflect on a recent challenge they were facing and then asked what they are going to do to address this challenge. For example, one participant stated, she “has a string [orchestra] solo next week and is really nervous” but will overcome this challenge by “practicing a lot” (Student 19). Another student mentioned, “One time, I was confused and didn't ask for help recently. Next time, I will ask for help when I am confused instead of being too nervous. I feel like when I do that then I will do better in all subjects, not just math” (Student 9). Both students spoke about being aware of nervousness or anxiety, with one using the growth mindset strategy of effort to overcome nervousness, while the other student focused on asking for help. Each student recognized a fixed mindset challenge that needed to be changed to a growth mindset.
Another example of awareness of a fixed mindset and progressing to a growth mindset occurred during Unit Three of the innovation. During Unit Three lesson three, a process was shared to change a fixed mindset to a growth mindset with a strategy called “fight or flight.” The lesson focused on what to do with emotions and learning. The lesson specifically gave the strategy of employing “positive self-talk” with students looking at situations in different ways and using journaling as an option. In the Unit Three activities, the students were prompted to first journal on a recent challenge. One female student responded:

I have a challenge with thinking positively about myself. I am confident and content with myself normally most of the time, but I think I get in my own head a lot. One of the things that perpetuates this is the fear of someone being better than me and this is bad. I want to be able to grow and be able to find happiness in the success I do have instead of don’t of what someone else has [that I don’t have].

(Student 6)

The student expressed awareness of her fixed mindset clearly and then was prompted to reflect on how she would overcome this challenge:

I have wrote about it before to get it off my chest and to be able to look back on it, reflect, and seek change. I have been kind of successful, but I think it is not something you completely get rid of, whether you think so or not everybody thinks less of themselves than everyone around them. Reminding yourself EVERYONE has flaws and it’s not the end of the world that you don't have a trait someone else has. (Student 6)
This student’s responses to the prompt conveyed that she understood the strategy and began using this specific strategy to change her fixed mindset to a growth mindset. Responses from the prompts revealed that the students were able to recognize a fixed mindset challenge and then the students disclosed in a proceeding prompt how they changed from fixed mindset to a growth mindset.

**Students Who Did Not Understand Growth Mindset Prior to Innovation**

Now Understand. Students were asked if they understood growth mindset prior to the innovation, then were asked after the innovation about growth mindset. Students expressed their understandings of a growth mindset in their journal responses. During this specific study, students conveyed they better understood growth mindset.

From the pre-interview data collected in the Map Tool survey, 13 of the 27 students responded they had heard of growth mindset before coming to this class, seven stated maybe, and six stated they had not heard of growth mindset. Focusing specifically on the responses from the six students that had not heard of growth mindset, I discovered these six students demonstrated knowledge and understanding of growth mindset through their journal responses, as well as postinterview responses. For example, Student 6 was asked in a journal prompt about a recent choice she had made with a fixed mindset and what would she do differently next time to make a growth mindset choice. The student responded, “Got a worse grade on a test than my friend and then thought about it for the rest of the day, thinking what they did better than me to get that score.” This type of response was indicative of a fixed mindset. She went on, however, to say, “Instead, I should ask for help studying instead of being jealous and end up hurting myself,” which expressed an understanding of a growth mindset. Student 11 responded similarly stating,
“When I was little, I was really bad at art. I just kept drawing. Practice makes perfect” (Unit 3 Journal). Both students reflected an understanding of a fixed mindset and moved to a growth mindset.

Student participants also exemplified their movement from a fixed mindset to a growth mindset when they shared their understanding of the growth mindset in their digital portfolios. In the first example below, Student 14 shared her thinking:

My MAP level was 20, which means I more leaned thinking my intelligence doesn't really change, and I don't want to make many mistakes or learn harder things. Of course, you shouldn't think this way just because you got a certain outcome from this kind of test. This is just an idea to see what you are like to help change or try to see things differently. (Student 14)

In another example from a student’s portfolio, Student 13 was athletic and outgoing but also tended to express her perfectionist tendencies. During our innovation, she was faced with some trying times with losing a close family member and the stress of trying out for a position on an upper-level team. This was an opportunity to practice and use a growth mindset, and we talked about it a lot. Below in a text quotation and Figure 4.7 is an excerpt from her portfolio with a visual shared by the student:

Do you know what growth mindset is? If you don't, I am here to tell. Growth mindset means you thrive on challenges, and you do not see failure. You grow and develop your abilities. (Student 13, digital portfolio)
With posted visuals to support their learning, these visuals were not generic but researched and found to support learning. The student went above and beyond to share her understanding from the unit, as well as her understanding of a growth mindset.

**Theme 2: Growth mindset strategies supported students’ self-efficacy in multiple school and classroom areas.**

Students were presented with strategies during the innovation that used Brainology from Mindset Works©. The innovation helped students develop growth mindset strategies. To have a growth mindset is the belief that one’s skills, strengths, and abilities can be enhanced through effort and purpose (Han & Stieha, 2020). In this study, the strategies students learned and developed included making mistakes, replacing fixed mindset language with growth mindset language, recognizing, and valuing process over results and practicing calming techniques.
Individuals with high self-efficacy tend to approach difficult tasks and challenges with a mastery-based mentality (Bandura, 1994). For example, when presented with feedback after working on a challenging academic task, a student with a growth mindset reported that he or she had the skills to reach their goal (strong self-efficacy (Burnette et al., 2020). A growth mindset was a persuasive tool that conveyed a message that academic development was possible. In turn, a growth mindset bolstered confidence in my student participants in school and classroom areas. Students consistently mentioned the ability to use growth mindset strategies to speak with more confidence.

The findings for this theme were developed from three categories: (a) supporting self-efficacy in public speaking (b) supporting self-efficacy in school, and (c) taking on new tasks. In addition, findings in this theme identified (d) some indifference to student participants’ self-efficacy.

**Supporting Self-efficacy in Public Speaking.** Supporting self-efficacy in public speaking was defined as the student participants expressing more confidence to speak in front of others, as well as presenting a speech in front of classmates. Participants articulated more confidence with talking and taking action in different situations. Individuals’ self-beliefs of efficacy can affect the challenges they undertake, the amount of effort they expend in an endeavor, and the level of perseverance they employ in the face of difficulties (Wood & Bandura, 1989). Speaking in public, specifically in front of middle school peers, can be difficult for adolescents. Improved self-efficacy developed confidence in the student participants related to their abilities to speak in front of others. Participants expressed improvement during post interviews specifically in their speeches. For example, one student said, “At the beginning I was nervous, but the more I learned
how to control my nerves, and on our second to last speech, I was confident and knew I could do it” (Student 2, post interview). She reflected how a growth mindset supported her to be more confident when public speaking. That the growth mindset innovation supported self-efficacy in public speaking was evident from other students as well. For example, another participant noted, “I’ve definitely gotten better with public speaking, especially like around people that I’m comfortable with and I know” (Student 16, post interview). Participants recognized that their confidence had grown and become better at speaking to other people since the innovation.

In their journals, students considered how the growth mindset innovation might have impacted their confidence. For example, four participants wrote in their journal entries (05/24/2022):

Student 14:  It [growth mindset] has upped my confidence and made me better as a person. I am not afraid to speak in front of people.

Student 4:  It [growth mindset] helped me become better at speaking in front of people.

Student 7:  I have not backed down from getting up in math class and speaking.

Student 9:  I speak up more in class and feel confident doing it.

There was a consensus that the students believed their self-confidence had improved since the innovation and from their knowledge of a growth mindset.

While this innovation focused on public speaking, some of my students broadened public speaking from just giving speeches, like those we prepared in class, to generally
speaking in front of others. For example, one student mentioned how the growth mindset strategies helped with speaking to peers:

So, I've always been able to speak with adults very well, but I’ve always had a problem with speaking to people in my own age, because that's just made me a lot more anxious and stuff. But I've actually been able to speak with people my own age a lot better recently, and my speaking skills with people like my own age has really improved, and I always been able to like go up in front of a class like and do speeches and stuff. (Student 2, postinterview)

It was not only recognized that the innovation impacted student's giving speeches but also supported this student’s growth in self-efficacy when dealing with and speaking to peers. Increased confidence has been an indicator of improved self-efficacy (Wood & Bandura, 1989), with students expressing an increase in confidence. As a result of learning growth mindset strategies, students expressed changes to their confidence at the end of the innovation.

**Supporting Self-Efficacy in School.** While the innovation focused on developing a growth mindset and building self-efficacy within the leadership course, students expressed that the innovation affected other areas in their school-lives. Supporting self-efficacy in school was defined as students expressing more confidence in broader areas of school, such as speaking out in class, lowering stress, and being more confident in academic activities. A connection was identified by student participants between confidence and success in areas of school.

The participants did not directly mention self-efficacy within their data. Instead, they spoke of “confidence,” accomplishing tasks, and struggling in their schooling, which
I interpreted as indicators of self-efficacy. For example, in the final portion of the innovation, students were asked to respond to journal prompts reflecting on how a growth mindset had supported them. One student responded, “It [Growth mindset] told me that if I make a mistake that it [the mistake] can help me learn. It [Growth mindset] will tell me that it's ok to mess up and just have more confidence after” (Sam, journal entry 05/24/2022). Growth mindset strategies learned from the innovation fostered more confidence in making mistakes in school for this student. Another student mentioned how growth mindset strategies strengthened her self-efficacy in managing stress in school:

    It has helped me manage my stress like about a week ago I had two tests, a quiz and a major grade and I remembered what to do and I took a deep breath took a few of the tips and continued and I got it done. (Student 16, journal entry 05/24/2022)

Other students spoke about how the growth mindset strategies impacted how they learn. For example, one student stated in the end-of-innovation journal, “I guess learning about how I can learn more has made me feel better because I know I have not learned enough yet and that's okay because I can still learn more later” (Student 14). This student’s quote suggested that when learning in school and in general, it was all right to fail and put in the effort to get better.

    Lastly, a student who typically does well in all areas of academics discussed her struggles with asking for help. During the interview she stated:

    Okay, so in like when it comes to math, like specifically, I occasionally will like struggle with the subject which is annoying. It's very annoying. But I used to have like a really hard time about asking for help, ‘cause I've always hated it. It's
always been a burden, and I always thought you can do it on your own and got this on your own, and I've learned that I don't have to do it on my own. I can ask for help, and I've been like, “I have fixed mindset.” I have had a fixed mindset recently. I've been trying to like to have a growth mindset being like, “Hey, this is fine. You can ask for help. You can do it, and you do not have to do it on your own like.” (Student 2, postinterview)

Being confident to know when to ask for help aligns with growth mindset. In her quote above, this student addressed moving from the fixed mindset language of “I don’t need help” to growth mindset language of “I can ask for help,” which supported her self-efficacy in school.

Student participants also expressed how they would use growth mindset strategies in different areas of their lives to support their self-efficacy. For example, three students spoke in the postinterview to strategies that would help them:

Student 6: I feel like one thing we learned about growth mindset is self-confidence, like just telling yourself you can do it.

Student 27: I have used a growth mindset by thinking I can do things, even if others tell me I cannot.

Student 8: It’s kind of helped me like know how to write a speech better and like calm myself down while giving the speech, so I can just make it better.

Not only did the innovation support self-efficacy in targeted learning areas like speeches and speaking, but students conveyed how it helped in other areas of confidence such as
staying calm in school situations and having the confidence to do things they might not have done prior to the innovation.

Not all data supported participants’ growth in self-efficacy. Some of the participants’ data were contrary. However supportive the innovation was for self-efficacy, some students indicated a growth mindset did not impact them. For example, in the end-of-innovation journal entry, questions were posed to student participants. Question Two asked, “Do you feel more confident with giving a speech in front of the class after learning about growth mindset? Give me an example of when you felt confident.”, and the third question asked, “How has learning about a growth mindset and the brain supported your confidence in being a leader and using leadership skills such as public speaking? Give me an example of a time you have seen this in yourself.” Each question was responded to with 27 responses. Question Two showed 11 of the 27 responses expressing that they did not feel more confident giving a speech. Question Three resulted in five of the 27 responses expressing that the growth mindset did not improve their confidence.

**Encouraging Taking on New Tasks.** Taking on new tasks was defined as student participants expressing more confidence to take on a new task because of their knowledge of growth mindset strategies. Participants expressed that they were less hesitant to try something new and challenging that they might have avoided previously. Individuals with higher confidence in their capabilities approach difficult tasks as challenges to be mastered rather than as threats to be avoided (Bandura, 1994). Students with growth mindsets set goals focused on learning, adopt mastery-oriented approaches
like seeking help from others, persist, and remain efficacious when faced with obstacles (Burnette et.al, 2020).

To explicitly address this indicator of growth mindset strategies and self-efficacy, during the focus group post-interview, I asked students about their confidence in taking on a new task. Three students responded with the following excerpt, indicating their confidence and thinking:

Student 8: I mean, if you're not good at it [a new task], you are gonna’ have to practice it, and I mean, the more you practice it, the better you will be at it.

Student 6: Um yeah, because I mean I took Teen Leadership [course]. I didn't think I was gonna’ be able to do that, and I mean, I'm decent at like giving speeches and stuff. So yeah.

Student 2: Because, like, there's many different ways to do something. And there's not just one solid way to do it [a new task]. and if I'm not good at that, I can try something else. I've been putting myself out of my comfort zone to do different things, and try new things, which is hard for me most of the time. But I've gone now and [am] starting to do more stuff.

And a brief exchange with Student 3 post-interview indicated their confidence in taking on a new task:

Teacher: What do you think? Would you take on a new task, even if you knew you weren’t good at it?

Student 3: Yes.
Teacher: Okay. Why would you do that — to try it?

Student 3: Just try something new.

Teacher: And what happens if you fail?

Student 3: Try again.

This conversation allowed the students to explore the idea of taking on a new task even if they were not good at that task. The responses reflected a growth mindset strategy and language associated with a growth mindset, such as “try different ways,” “try again,” and “try new ways.” These are considered typical terms of an individual exhibiting a growth mindset. Students expressed confidence in taking on a new task as a behavior or activity they would be willing to do, indicative of their understanding of growth mindset.

*Theme 3: Students’ perceptions of the growth mindset innovation were both positive, negative, and indifferent.*

Students’ perceptions of the growth mindset innovation were defined as the way students perceived how the growth mindset innovation impacted them. These perceptions were categorized as positive, negative, and indifferent expressions. Students expressed the impact the growth mindset innovation had on them through journals, portfolios, and interview responses. The goal of any mindset intervention is to improve a student’s frame of mind, and therefore increase learning, and the evidence indicating efficacy of mindset interventions is strong (Dweck, 2018; Pasarelli, 2014). The intention for this study was for students to experience a growth mindset innovation that could build their growth mindset to support self-efficacy. According to Passarelli (2014), interventions are not complicated; they can be as simple as changing the kind of encouragement a student receives or giving them a one-hour session on how to create academic abilities. During
the innovation student’s experiences were unique with each participant expressing different perceptions of the growth mindset innovation, sharing openly about their experiences.

Positive Perceptions. The intention of the innovation was for growth mindset to support students’ self-efficacy specifically with public speaking. Throughout the data collection, many students expressed positive reactions. For example, in the end-of-innovation journal, the question was posed if students felt more confident with giving a speech in front of the class after learning about growth mindset? Student participants responded with feedback supporting both positive, negative, and indifferent perceptions. For example, Student 4 responded, “I felt confident while giving my 3rd speech. I was able to write a story on how I got diagnosed with Type One diabetes.” Another student wrote, “I feel kind of confident after giving a speech because I like knowing I was able to stand up in front of a class and talk” (student 14). Lastly, Student 27 wrote, “I feel confident when working on an art piece.” So, these students expressed positive perceptions regarding innovation and improvements with their confidence, or self-efficacy.

At other points in the data collection, students expressed positive reactions and improved knowledge and skills. For example, when asked about taking on new tasks, one student said, “I mean if you're not good at it, you are gonna’ have to practice it, and I mean the more you practice it the better you will be at it” (Student 8). Another participant took on a different perception of how growth mindset allowed her to make mistakes and feel more comfortable with mistakes stated:
So, I've learned that growth mindset is so important to have because if I get frustrated with something, I may just like quit, which is a problem, and it's bad to quit something like that. (Student 2)

This student, like many other participants, expressed a more positive experience with a growth mindset.

**Negative Perceptions.** As noted previously, though, not all participants found the innovation beneficial, and they expressed negative perceptions about it. For example, in response to an interview question about new tasks, a participant responded with a negative reflection. He stated, “No, no, because I if I already know I'm not gonna’ do good at it then there might not be really a good reason why, for me to do it” (Student 14). Similarly, a prompt in the end-of-innovation journal asked students if learning about growth mindset had helped their confidence in giving speeches. Nine of the responses to that prompt were “No.” For example, Student 12 stated, “No, I usually don't feel confident while giving a speech in front of a class.” Student 20 mentioned, “No, I always felt doubtful giving speeches.” And Student 11 responded negatively as well: “I don't like speaking in front of people or people in general and this class didn’t change that.” These student participants' perceptions lead to a more negative experience with the innovation.

**Indifferent Perceptions.** For some of my students, the innovation seemed neither a positive nor negative experience. As is typical for adolescents, they were indifferent to the growth mindset innovation and whether there were aspects of it that may have helped them. For example, one student expressed how he might respond to a new task that he was not prepared for. He responded to whether he would take it on with:
“Uh, no because I need more experience, more experience” (Student 15). Another student responded apathetically to growing from mistakes with the following:

I don't really like making mistakes but when I make mistakes. I don't really. I mean I don't really learn from them I kind of do it over and over until I think it will work at some point. And then I’m just like, okay, you have to stop and try another way, because obviously the way you're trying to do things isn't working, you got to give up at some point. (Student 14)

This student participant did not change her mindset to a growth mindset, with the student uninterested in making mistakes; however, the last part of the response mentions “trying another way when something is not working, which does align with growth mindset thinking. But in several instances, students responded to interview questions and prompts with “No,” or “None,” like Student 12 did when asked about if he felt more confident with public speaking. Throughout the innovation, students’ perceptions collected in a multitude of data points have shown to be not just positive, but also indifferent and negative.

**Theme 4: Digital portfolios were designed to represent student knowledge, but students were impacted little by them.**

The digital portfolios in this innovation were designed to represent student knowledge, but they resulted in little impact on students’ experiences. This was based on the students’ perceptions about digital portfolios. These perceptions identified how the portfolios had very little influence on their learning, identified through their experience with portfolios, reflections, and interviews. A digital portfolio is a learning tool used to
encourage learners to actively participate in their education, with it being a versatile learning tool that contains many possibilities and advantages (Virolainen, 2009).

During the study, students were asked to develop a digital portfolio website using Google Sites to express their learning of the innovation content with the intent of allowing them to be active participants in their learning. One key advantage was the opportunity for students to use a student-centered constructivist learning approach that saw the student as an active knowledge builder (Virolainen, 2009). During the presurvey process, student participants were asked to express first their experience with using digital tools, as well as if they believed they could complete a task in a digital portfolio. Participants shared confidence in their experience with digital tools such as Google Applications for Education, as well as confidence in completing a task using a digital tool. During the innovation, students were directed to represent their knowledge by using Google Sites to express their understanding of the content. If students did not accept the digital portfolio as a holistic means with which to document their learning in different contexts and, more importantly, agree or wish to use the portfolio as an integral part of their educational experience, then the potential impact the digital portfolio could have on learning would not be realized (Tosh et al., 2005). Throughout the innovation, students were asked to reflect on their experience with digital portfolios. Reflection acknowledged that the digital portfolio had little effect on their learning experience.

The findings for this theme were developed from four categories (a) able to take on task of a digital portfolio, (b) prior experience with digital platforms, (c) preferences for traditional paper or digital platforms, and (d) activities that supported understanding
of growth mindset. The findings in this theme did show that students perceptions
reflected that the digital portfolio had little impact on them.

**Able to Take on the Task of a Digital Portfolio.** Being able to take on a task of
a digital portfolio was defined as student participants reflecting on their ability to take on
the task of working with a digital portfolio. Careful consideration had to be undertaken
for this learning tool to be successfully adopted by students in their learning. This
included understanding students’ perspectives in the usefulness of this learning tool, as
well as the overall perceived effectiveness (Song, 2020). The start of the innovation
survey allowed for students to express their perspectives.

During the MAP tool survey, students were asked if they believed they were able
to complete tasks in creating a digital portfolio? Eighteen students replied that they
believed they were able to complete the portfolio with some of their reasoning being:

- **Student 3:** Yes, because I feel like I work better online.
- **Student 5:** Yes. I can make it look the way I want it to look.
- **Student 4:** Yeah, I'm on good at online stuff.
- **Student 25:** Yes, because I need to be organized.

Over 50% of the students recognized they had the ability to take on the task of a digital
portfolio with another student from the survey stating, “Yes, because I know most
Google Sites, so this might not be too hard” (Student 19).

Some students responded in the MAP tool survey that they were not sure if they
would be able to take on the task of creating a digital portfolio with the common response
being “I don’t know” from four of the respondents. Of those four respondents, one
student mentioned his preference of paper stating, “No, I like to work on paper” (Student
Another student participant stated, “Kind of, I sometimes do better and enjoy completing things on paper rather than staring at a screen and doing work digital” (Student 4). Students recognized their preference of using paper to complete a task over using a digital platform.

**Prior Experience with Digital Platforms.** Students having prior experience with digital platforms was defined as students sharing their experiences with digital platforms such as Google applications to help determine their ability in creating a digital portfolio prior to the innovation. At the start of the innovation process, students were asked in the pre-interview to consider if they had used a digital portfolio for projects in their previous classes? Responses from students reflected they had previous experience working with Google tools. Students responded in their pre-interviews that the tools were helpful with reasons including:

- **Student 19:** I do, working on computers can be helpful with organization.
- **Student 6:** Yeah, I used Google slides a lot, like in elementary school we had to make the website.
- **Student 2:** Every day we use google slides. Uh, yes. In some ways it’s helpful.

So, students used similar digital tools daily in their classrooms. Other student participants mentioned the usefulness of being able to present information in a nice template, as well as how Google applications were where they obtained most of their information.

Students were further prompted in the MAP Tool survey to express their experience with types of Google educational applications. All student participants responded with a digital learning tool from Google that they had experience with, and most listed multiple applications they were familiar with. For example, students
responded, “all of them,” while others mentioned Google Slides, Google Docs, Google Sites, PDFs, and Kami.

**Preferences for Traditional Paper or Digital Platforms.** The category of preferences for traditional paper or digital platforms was defined as an emerging pattern of students expressing how they knew how to use Google educational applications; however, they preferred to use traditional paper to express their learning while others preferred digital platforms. The emerging category of preferences between digital and traditional paper first emerged in the MAP tool survey at the start of the innovation. Students were asked if they believed they could complete a task in a digital portfolio. One student mentioned his preference of paper stating, “No, I like to work on paper” (Student 12), and another student participant stated, “I sometimes do better and enjoy completing things on paper rather than staring at a screen and doing work digital” (Student 4).

Students recognized their preferences for using paper to complete a task over using a digital platform. However, most of the students expressed their preference for digital platforms, stating that it helped them with “organization,” “creativity,” and “expression” of their learning experience.

During the pre-interview, students were asked to reflect on their experiences with digital tools, as well as to consider if they were helpful or not for their learning. One student responded with:

Every day we use Google Slides. Uh, yes. In some ways it’s helpful, but I would much rather do work on paper and in person. Everybody feeds off each other’s energy. It’s a lot easier for me to focus on paper and everybody else and do
projects on paper because there’s so many other sites to get distracted on the main point of the project. (Student 2, pre-interview)

Another student responded in a similar fashion. She said, “I like using computers, but I’d say that I’m more like organized. I like to use paper” (Student 19). Both students revealed they preferred using paper over digital platforms. However, most of the respondents expressed during the pre-interview that they preferred using digital platforms. Each student participant identified unique reasons for their preferences with both paper and digital platforms being options for their learning.

**Activities that Supported Understanding of Growth Mindset.** Activities that supported understanding of growth mindset were activities related to the innovation and digital portfolio that student participants considered supportive of their personal understanding of growth mindset. During the innovation students were given lessons to help them develop their growth mindsets then asked to express their understanding in a digital portfolio as well as in journals and workbook activities.

In the end-of-innovation journal students were asked to respond to the question “When developing your digital portfolio, what were some activities and/or assignments that supported you to better understand growth mindset and how it works with developing your leadership capacity?” Responses to the question identifying activities student participants preferred included:

Student 16: Unit 2 was one that helped me because it helped me understand that some of the people with bad problems when they were young achieved some of the greatest moments.
Student 24: It showed me how important the brain is and how I need to take care of it and use it correctly and give it the correct nutrients.

Student 2: All the units we worked on. I found it really interesting.

While not specifically mentioning the digital portfolio, students did mention the workbooks and units from the innovation that helped them understand the growth mindset further. One pattern that appeared when the question was posed in the end-of-innovation journal was excitement about and value for the workbook. Students responded with:

Student 18: I think that the unit workbooks helped me learn more about my brain and helped me become a better leader.

Student 5: The workbooks helped me.

Student 25: The workbooks taught me so much about my brain and helped me really dig deeper into things that I'm scared of or love.

Student 13: I liked looking at our workbooks.

Student 9: The unit workbooks.

Five of the 27 responses mentioned the workbook as an activity that supported the students to better understand growth mindset.

Students were connected to the innovation’s activities but not necessarily to the digital portfolio activities. The digital portfolio's purpose was to allow the students to reflect on their learning in their own ways. For some students, the digital portfolios reflected their work and learning, but for many students, there was a disconnect in representing their new knowledge.
Chapter Summary

Findings from analyses of quantitative and qualitative data presented different outcomes for the impact of a growth mindset innovation on student’s self-efficacy using a digital portfolio. Quantitative research results identified overall that the student participants \((n = 23)\) increased their speaking self-efficacy. Furthermore, the prescore was significantly less than the postscore with a difference of 5.12 from the pre-and-post scores. A positive increase shows the students speaking self-efficacy increased after the innovation. The MAP Tool survey data also showed an increase; however, the difference was only a slight increase by a point. In a further item analysis, the growth mindset questions showed important growth.

Qualitatively students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention resulted in positive, negative, and indifferent perceptions. Students not only identified change in their personal growth mindset but also reflected on how they would use growth mindset if they perceived and change. It was recognized in the research that not only was growth mindset impactful in public speaking in the Teen Leadership course but in other areas of a student's life as well. Lastly, some students expressed an indifferent and or negative experience with the innovation, stating no change or lack of change.
CHAPTER 5
DISCUSSION, IMPLICATIONS, AND LIMITATIONS

The purpose of this action research was to identify the impact of a growth mindset innovation using a digital portfolio on students’ self-efficacy in a middle school leadership course. This chapter includes a discussion of major findings as related to the perceptions of students’ self-efficacy on public speaking, the impact the growth mindset innovation had on students’ self-efficacy, as well as the impact the innovation had in other areas of students’ lives. The chapter concludes with implications for practice and future research along with limitations of the study.

Discussion

The role of noncognitive factors in shaping school performance have been considered just as important as academics. Studies have shown that a student’s success is not grounded just in their academic performance but also by qualities such as motivation, perseverance, ability to accept criticism, time management, and study skills (Bowen, Chingos, & McPherson 2009). Growth mindset proposed that regardless of experience or knowledge success was attainable for students (Dweck, 1999). An individual with a fixed mindset believed that intelligence and other qualities were set and unchangeable, where those with a growth mindset believed intelligence and talent could be developed with effort (Dweck, 2006). Confidence and self-efficacy naturally align with the philosophy of growth mindset. This study implemented an innovation of curriculum to teach growth mindset philosophy and skills to students as part of a middle school
leadership course, while looking at the impacts on students’ self-efficacy with public speaking through a digital portfolio.

While the quantitative and qualitative findings from this research were previously presented in Chapter 4, this section will discuss these findings in relationship to the extant related literature to help answer the two research questions: (a) How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course? and (b) What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset innovation?

**Research Question 1 How can a growth mindset innovation using a digital portfolio support self-efficacy improvement in middle school students taking a leadership course?**

In this study, growth mindset can be looked at was operationalized as the idea that skills and abilities can be improved — they were not fixed — and the development of skills and abilities was the goal of work (NLI, 2019). Previous growth mindset innovations have indicated promising findings (WWC, 2022). Curricula, such as The Brainology® program based on Dweck’s (1999, 2000, 2003, 2007) research, as well as neuroscience research on brain plasticity and malleability (Blackwell et al., 2007). Growth mindset innovations have supported improved student outcomes, such as improved motivation, improved math scores, decreased bullying, changed mindsets of students, and increased GPAs (Sparks, 2021). Additionally, students with more of a growth mindset characteristically have had higher levels of self-efficacy than students with more of a fixed mindset (Dweck & Master, 2009). This research question will be
discussed in two sections: (a) growth mindset theory supported student improvement and
(b) digital portfolios documented and facilitated knowledge from the growth mindset
innovation.

**Growth Mindset Theory Supports Student Improvement.** A multitude of
factors shape how students learn with a broad spectrum of ideas on how to support
student improvement. Students often fear they lack the necessary ability to succeed
(Rimm et al., 2018), which in turn results in intrapersonal issues like poor self-efficacy,
expectations of success, and self-regulation (Rubenstein et al., 2012; Tan et al., 2016).
The Brainology program used in the current study was borne from years of research
around growth mindset. Launching from Dweck and her teams’ research, many studies
have reported the positive effects of mindset interventions on students learning, mistakes,
and effort (e.g., Blackwell et al. 2007; Costa & Faria, 2018; Dweck, 2009). This study’s
innovation was conducted during a Teen Leadership course for middle school students,
which sought to help students take responsibility for themselves while also equipping
them with the skills needed to handle difficult situations (Waters et al., 2019). The
purpose of the course aligned with the philosophy of growth mindset and improving
students’ perceptions of themselves and their self-efficacy, particularly with public
speaking.

The findings in this study have contributed to the understanding of growth
mindset and its connection to self-efficacy for middle school students. This action
research offered additional insights into the impact a growth mindset innovation could
have on students’ self-efficacy. For example, the quantitative findings showed a small
increase in students’ growth mindset of students during the innovation. While overall
postsurvey means ($M = 25.39, SD = 6.10$) were higher than presurvey means ($M = 24.57, SD = 6.31$), the differences did not reach statistical significance ($p = .22$). However, examining the items individually, it was discovered that growth mindset items six of them increased or stayed the same, Item 3 showed the prescore ($M = 2.79, SD = 1.69$) and a sizeable increase to the postscore ($M = 3.42, SD = 1.56$), which showed important student growth. The descriptive statistics of the growth mindset item illustrate a sizeable increase for the prescore ($M = 13.71, SD = 4.76$) to the postscore ($M = 15.61, SD = 4.69$). The current findings are like recent results from Samuel and Warner (2021) who reported lower student math anxiety scores and increased student math self-efficacy scores after a growth mindset intervention. My findings also corroborate Anderson and Lu’s (2017) report that learning leadership skills developed adolescents’ confidence and self-efficacy.

Researchers have also shown that it is possible for students to develop different mindsets when they participate in targeted growth mindset exercises (e.g., Paunesku et. al, 2015). Theoretically, growth mindset theory is aligned with incremental theory, where an individual believes personal attributes are malleable and can be changed and developed over time (Blackwell et al., 2007; Dweck, 1999, 2006; Dweck et al., 1995; Dweck & Yeager, 2019; Schneider, 1973). Much of the evidence supporting mindset interventions changing the nature of students’ interactions with content is drawn from studies in which students report their perceptions on achievement goal orientation, attributions, or the value of effort before and after an intervention (e.g., Aronson et al. 2002; Blackwell et al. 2007; Sorich & Dweck, 1999). Other studies have attempted to assess the way that students interact with academic content by observing children’s
behaviors and choices in laboratory problem-solving tasks (e.g., Diener & Dweck, 1980; Mangels et al., 2006; Mueller & Dweck, 1998). These psychological interventions have been precisely targeted to spark positive recursive cycles that encourage different mindsets to take hold over time, that is incrementally (Yaegar & Walton, 2011). During the present study, many of the students perceived to have developed a growth mindset in public speaking as well as other areas. An emergent theme from the qualitative findings of the action researched identified that students were more comfortable with making mistakes, and some students developed an awareness of having a fixed mindset and changed to using a growth mindset. For example, one student said, “I mean, I realized I don’t have to do everything perfectly.” Also, students who did not understand growth mindset prior to the innovation now showed a clearer understanding of how growth mindset may affect their perceptions and abilities For example, one participant stated, she “has a string [orchestra] solo next week and is really nervous” but will overcome this challenge by “practicing a lot.” These qualitative findings align with Blackwell et al.’s (2007) results that incremental theory, such as growth mindset theory, was positively associated with positive effort beliefs.

Digital portfolios documented and facilitated knowledge from the growth mindset innovation. Early reports of digital portfolios tended to focus on the potential record keeping aspects of portfolios or on the benefits of multimedia to record features of learning (Wall et al., 2006). But digital portfolios’ purposes and uses have grown to emphasize students expressing and reflecting on their learning. A digital portfolio is a multimedia collection of a student’s work that can be stored and assessed on a digital
platform (Milman, 2014; Niguidula, 2005; Tezci & Dikici, 2006), helping to be able to document learning.

In this study, students were asked to use Google Sites as a digital portfolio to express their understanding of each unit of the innovation. Findings showed that students were able to share what they were learning by using a digital portfolio. Pre- and post-surveys prompted students to consider if they felt capable of taking on the task of a digital portfolio, and results reflected confidence in using and working with a digital portfolio. Digital portfolios have enabled the development of psychological ownership in learners, which is beneficial in numerous ways (Zhang & Tur, 2022), with student participants in this study benefiting with a connection to growth mindset using the portfolio. For example, students who previously expressed not knowing about growth mindset expressed their knowledge of a growth mindset through representing their learning as text and graphics in digital portfolios, making their development visible. The portfolios also provided insights on students’ growth mindset development. According to Seitz (2023), portfolios can demonstrate how teachers can help students learn, as well as reflect on their practice.

However beneficial digital portfolios have been, not all students and faculty are motivated by the same pedagogical strategies (Kehoe & Goudzwaard, 2015). Findings from this study elucidated a theme of students preferring paper over digital types of learning. More specifically, students lacked a connection between the digital portfolio and how it supported their learning. In a recent study using digital portfolios in a physics course, students perceived the portfolio as a tool that afforded reflection in learning (Espinel-Rubio, Hernandez-Suarez, & Paz-Montes, 2021). Although students’ responses
in my study did not support a significant connection between their learning using a digital portfolio, the work submitted was consistent with students understanding the innovation.

**Research Question 2 What are students’ perceptions on their self-efficacy in giving a speech before and after implementing a growth mindset intervention?**

In this study self-efficacy was defined as a belief in one’s own ability to be successful in specific circumstances (Bandura, 1986). It has been established that self-efficacy is a strong predictor of achievement in middle school students, and a drop in confidence in the middle school years can have a negative influence on achievement (Zeldin & Pajares, 2000). A growth mindset alone, according to Bandura, does not necessarily protect against negative results; having a strong belief in one’s personal capability, using her abilities to accomplish a particular task, and having a strong sense of self-efficacy are essential (Chen & Tutwiler, 2017). More so, when speaking in public, it has been found that those with strong self-efficacy express a stronger ability to communicate (Agung et al., 2022). This section will reflect on how students perceived a change in their self-efficacy, looking at specific responses from quantitative and qualitative data that identified a growth in self-efficacy not only in speaking but other areas.

**Students Present Evidence of Change in Self-efficacy.** Students with more of a growth mindset characteristically had higher levels of self-efficacy than students with more of a fixed mindset (Dweck & Master, 2009). Similar results were suggested in this study as well, with results considering that a growth mindset innovation can have an impact on a student’s perceptions of their personal self-efficacy in speaking. To help support students’ self-efficacy, a growth mindset innovation was employed during this
study to build self-efficacy. During the study, students responded to a pre- and postsurvey about their levels of self-efficacy, and it indicated modest growth (Presurvey $M = 69.49$, $SD = 14.37$; Postsurvey $M = 74.61$, $SD = 14.48$) for students’ self-efficacy. A recent study examining self-efficacy using a growth mindset intervention obtained similar results with the intervention resulting in significant change (Kramer et al., 2023). Also, during interviews, students were prompted to consider their confidence in areas of public speaking with responses stating, “At the beginning I was nervous, but the more I learned how to control my nerves, and on our second to last speech, I was confident and knew I could do it”, identifying a boost in confidence post innovation.

Jiang et al. (2023) reported similar results that suggest growth mindset interventions can have positive effect on social emotional outcomes. Evidence from this study also suggested that students not only experienced greater self-efficacy in speaking but also in other areas of school. Students perceived more confidence in speaking with others, in academics, and in sports or activities. Recent studies examining the impacts of a growth mindset intervention on self-efficacy have found it to not only impact public speaking but other areas such as STEM, motivation, writing, creativity (Samuel & Warner, 2019; Camacho et al., 2023; Kramer et al., 2023; Ting & Yeh, 2023). Results from both qualitative and quantitative analysis of the research identified that a growth mindset could impact student’s self-efficacy in multiple areas and raises potential for future research.

**Implications**

A student’s attitude towards his ability has shown to be directly associated to self-efficacy (Altunkaya, 2017; Paradewari, 2017). Not only did the research identify a
positive impact on students’ growth mindset but also identified future research to better understand the influence a growth mindset can have on a student’s self-efficacy in other areas of school. In this section the research addresses personal implications, implications for action and in practice as well as future implications in research. Also addressed are research limitations.

**Personal Implications**

The initial purpose of this action research using mixed methods was to help better understand the impact a growth mindset innovation could have on the self-efficacy of students. The leadership course taught at the middle school where the research took place asked students to go outside of their comfort zones and give speeches and other activities in front of their peers. The Teen Leadership course focused on helping students learn appropriate social skills, as well as develop important personal attributes and behaviors, such as self-confidence and public speaking. The goal of the class was to enable students to develop the skills that would set them up for success, both in school and later in life (Waters et al., 2019). As a result of the research, I learned having a growth mindset can impact a student’s self-efficacy, clarifying the research question focused on the impact growth mindset might have on students in a leadership course. In education it is important for stakeholders to rely on research to inform decision making in practice. Educational stakeholders rely on research to make informed decisions that ultimately affect the quality of schooling for their students (Clark et al., 2023).

Introducing the idea of growth mindset to students was something I thought was important for my classroom as growth mindset had such a personal impact in my life. Several themes emerged that confirmed my beliefs that a growth mindset can have a
positive impact on my students and allows me to make an informed decision on how to conduct an innovation in the future. An emerging impact from this research is the added support a growth mindset innovation can give to teen leaders in future courses. The Teen Leadership course focuses on helping students learn appropriate social skills, as well as develop important personal attributes and behaviors, such as self-confidence and public speaking. A key ingredient from the Waters et al. (2019) report noted that implementation of the LeadWorthy curriculum was done with modifications which shows fidelity, implying a growth mindset innovation.

Students’ digital experiences are vast (Ebner, 2017). When introducing a digital portfolio, I found most students had an ease with working with the technology portion of the innovation and did not find it to connect with the success or failure of the research. This specific area of the innovation had no implication on my research was not impactful when addressing the qualitative data. Students expressed indifference in the impact the digital portfolio with these unexpected findings are some way understandable, as all responding students expressed in their pre MAP tool survey that they felt at ease with working with creating and completing a task in a digital portfolio in some capacity. As technologies have advances and alongside current events such as the Covid outbreak students, families and adults have become more familiar with these platforms (Seitz, 2023), possibly making their impact nuanced in research. Another implication from the research was the identification of preferences when expressing learning. A pattern that emerged were students mentioning that sometimes they prefer traditional methods of expressing knowledge using paper. Teachers have reported in studies that providing
students with choices can increase engagement and teach self-regulation (Patall, Cooper, & Wynn, 2010), instead of limiting to just technology-based expression.

**Implications for Practice and Recommendations for Action**

A key area emerging from the results is that a growth mindset innovation can support a student’s self-efficacy not just with public speaking but also in other areas of a student’s life. The findings in this study reported that with a growth mindset innovation, students who showed a positive increase in their growth mindset also showed increase in speaking self-efficacy after the innovation. This result suggests that developing a student’s mindset in a leadership course could be an advantage for building a student’s self-efficacy. Chen and Tutwiler (2017) proposed that a strong belief in one’s personal capability to muster one’s resources to accomplish a particular task – that is, a strong sense of self-efficacy – is essential alongside a growth mindset for it to be effective. The importance of the findings allows future teachers to understand the relationship between both self-efficacy and growth mindset and the value it can bring to a classroom setting in hope of supporting students learning. For example, introducing a brief growth mindset intervention showed impact on students’ self-efficacy in public speaking and other areas, consider the opportunities for teachers to help support students undertaking difficult and complex tasks. Students identified being more comfortable with speaking once they understood that specific growth mindset strategies such as being alright with making a mistake or understanding that you have control of brain growth. One of the themes looked at how students changed their fixed mindset to a growth mindset when reflecting on a recent challenge. Two students recognized that they “have not backed down from getting up in math class and speaking”, and “I speak up more in
class and feel confident doing it”. Self-efficacy perception plays an important role in the learning process and becomes a balancing factor of those with low self-efficacy not being able to take on challenging task and increasing stress levels (Altunkaya, 2017).

Targeting some of the specific challenges students face using growth mindset activities could be used in future lessons. For example, students facing more rigorous tasks such as public speaking in middle school.

**Implications for Future Research**

These results hold implications for future research in the field of growth mindset and self-efficacy. In addition to addressing the implications and limitations of the research, further studies should also consider examining the connection between self-efficacy and growth mindset using a mindset innovation to support students in middle school grades. According to Paunesku et al. (2015), there is a possibility of making significant improvements to education on a large scale through interventions that develop growth mindsets. Based on the findings in this study, students showed an increase in their growth mindsets, as well as their self-efficacy. Continued research should examine the connections between growth mindsets and self-efficacy and their impacts on students. Such as the impact on student’s self-efficacy facing challenges and rigor. Growth mindset appears to be especially valuable to students that are academically high-risk, and growth mindset may contribute to specific goals (Sisk et al., 2018).

Although the present findings are promising, results should be replicated in other schools with similar or more diverse populations that represent groups that may be more affected by a growth mindset innovation. With results demonstrating students perceived the innovation to have some impact on public speaking, it is possible future research
areas could answer a more focused question such as can a growth mindset innovation be beneficial to an increase in self-efficacy in giving a speech, exploring more in-depth the speech aspect. Students who believe intelligence is malleable are more likely to work harder or try new strategies (Blackwell et.al, 2007) leaving a window open to explore new strategies. For example, students may be willing to take a risk trying new tasks such as complex math problems, speaking in front of peers, with the support of a growth mindset innovation. Educational research provides a vast landscape of knowledge on topics related to teaching and learning, curriculum and assessment, students’ cognitive and affective needs, cultural and socioeconomic factors of schools, and many other factors considered viable to improving schools (Clark et al., 2020). The investigation of the impacts of growth mindset innovations impact on self-efficacy had limited research as shown in the literature review of this paper. The results of this research should add to the body of knowledge in this area.

**Limitations**

Although the findings are promising, there are limitations to both the methods and the findings. First, the sample of middle school students chosen for the study, however diverse, were not a complete representation of the school and its population. A more diverse sample may make the findings more generalizable. Additionally, the research was conducted in the second semester of school. Although the course taught is only a semester course, typically second semester can add a different structure to the classroom opposed to the start of the school year.

Furthermore, it should be noted that students participating in this study were also completing a leadership course curriculum simultaneously with the growth mindset
innovation. Thus far, according to research by Waters et al. (2019), there were no significant differences in academic self-confidence and academic perseverance between Teen Leadership students and matched comparison students in either academic year or school group. The context for this research outside of a core content area may limit the transferability of the findings, and additional research may consider other disciplines, such as English language arts, math, science, and social studies courses.

Related to the quantitative results, students did show an improvement in growth mindset after the innovation. However, Sisk et al.’s (2015) meta-analysis cautions against expecting significant changes in by developing a growth mindset. This work demonstrates the impact the innovation had on developing a growth mindset, regardless of how large of a significance, due to identifying positive students’ perceptions from the innovation.

Last, the value of the digital portfolio was muddled. Although a digital portfolio using Google Sites to collect students’ understandings of the innovation was the preferred method, this showed limiting. The qualitative data and findings spoke little to the usefulness of the portfolio; the digital portfolio did not seem to have substantial impact on how the students developed their growth mindsets. Also, more recently, Brainology has added a digital workbook series that could take the place of the digital portfolio to help students reflect, apply, and process their understandings of growth mindset.

This chapter reviewed the findings from this study as well as the implications and limitations of this study. Students experiencing the growth mindset innovation expressed a better understanding of growth mindset and how it will support their self-efficacy, not only in public speaking but in other academic and personal areas. Data shared insight on
students moving the needle on their self-efficacy before and after the innovation, along with a slight progression in their growth mindset as well. Overall, the research proved to be impactful enough to explore further possibilities in the relationship between growth mindset innovations and self-efficacy using digital technologies.
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Shannon Kojah

202 Water Mill Rd.
Greer, SC 29650

Re: Pro00118557

Dear Mrs. Shannon Kojah:

This is to certify that the research study Supporting Self-Efficacy through Mindset: The impact of a growth mindset innovation using a digital portfolio on the self-efficacy of middle school students in a teen leadership course. was reviewed in accordance with 45 CFR 46.104(d)(1), the study received an exemption from Human Research Subject Regulations on 3/1/2022. No further action or Institutional Review Board (IRB) oversight is required, as long as the study remains the same. However, the Principal Investigator must inform the Office of Research Compliance of any changes in procedures involving human subjects. Changes to the current research study could result in a reclassification of the study and further review by the IRB.

Because this study was determined to be exempt from further IRB oversight, consent document(s), if applicable, are not stamped with an expiration date.

All research related records are to be retained for at least three (3) years after termination of the study.
The Office of Research Compliance is an administrative office that supports the University of South Carolina Institutional Review Board (USC IRB). If you have questions, contact Lisa Johnson at lisaj@mailbox.sc.edu or (803) 777-6670.

Sincerely,

Lisa M. Johnson
ORC Associate Director and IRB Manager
APPENDIX B

CONSENT FORM

UNIVERSITY OF SOUTH CAROLINA
CONSENT TO BE A RESEARCH SUBJECT

Supporting Self-Efficacy through Mindset: The impact of a growth mindset intervention on the self-efficacy of middle school students in a teen leadership course.

KEY INFORMATION ABOUT THIS RESEARCH STUDY:
Your child is invited to volunteer for a research study conducted by Shannon Kojah. I am a doctoral candidate in the College of Education at the University of South Carolina.

I am conducting a research study as part of the requirements of my doctoral degree in Curriculum & Instruction — Educational Technology, and I would like to invite your student to participate. I am studying the implications of a growth mindset innovation on students' self-efficacy while using a digital portfolio.

PROCEDURES:
If you decide to participate, you will be asked to do the following:

We are asking your child to be part of a research study that plans to conduct an action research study to implement and evaluate the impact of a growth mindset innovation aimed to improve self-efficacy using a digital portfolio. We plan to ask all students in a 7th grade classroom at your school between the ages of 11 and 14 to participate in our research.
**DURATION:**
If you agree for your child to be a part of this study and at least one of your parents gives permission, you will be participating in class activities learning about growth mindset. The innovation will take about 10 weeks. We would like to audiotape some of the interviews to make sure that our conversation is recorded accurately, but you can still be part of the study if you don’t want to be audiotaped.

**Voluntary nature of the study**
Participating in this study is completely voluntary. Even if your parents say you can talk to us, you do not have to do so. Even if you say yes, you may change your mind and stop at any time. You may also choose to not answer a question for any reason. In the event that you do withdraw from this study, the information you have already provided will be kept in a confidential manner. If you wish to withdraw from the study, please call or email Shannon Kojah (864) 355-7922 or skojah@email.sc.edu.

**RISKS/DISCOMFORTS:**
No known risks or discomforts

**BENEFITS:**
Taking part in this study is not likely to benefit you personally. However, this research may help researchers understand teachers’ needs and preferences for higher-level technology integration professional development.

**COSTS:**
There will be no costs to you for participating in this study.

**CONFIDENTIALITY OF RECORDS:**
Information obtained about you during this research study will remain confidential. Data will be aggregated via the Qualtrics reporting function. Study information will be securely stored in locked files and on password-protected computers. Results of this research study may be published or presented at
seminars; however, the report(s) or presentation(s) will not include your name or other identifying information about you.

The optional focus group interview will be recorded (audio and video) so that I can accurately transcribe what is discussed. The recording will only be reviewed by members of the research team and destroyed upon completion of the study. In particular, you will discuss your experience during the professional development.

CONTACT INFORMATION
If you have any questions about your participation in this study, contact Shannon Kojah at (864) 355-7922 or skojah@email.sc.edu, or my faculty advisor, Dr. Michael Grant at michaelmgrant@mailbox.sc.edu.

SIGNATURE OF CONSENT:
By signing below you are agreeing for your child to be a part of the above research innovation. If you do not want your student to be a part of the research, please check the decline box below.

____________________ Child Name
____________________ Parent Printed Name

____________________ Parent Signature____________________ Date

___ I decline to have my child participate in your research.
APPENDIX C
INTERVIEW PROTOCOL

Student Interview Questions

Interview 1 protocol

Students will be individually interviewed at the start of the research. The interviews will take place during class time, as the class is working individuals will be pulled aside to allow the process of the interviews to be a one-on-one format. Researcher will use a smart phone recording devices to collect data from the interviews and transcribe interviews.

1. How confident are you with giving speeches in front of your classmates?
2. Have you heard of Growth Mindset before coming to this class?
3. What types of digital learning have you used in school? For example, google slides, or google sites?

Interview 2:
1. Do you feel more confident with giving a speech in front of the class after learning about growth mindset?
2. How has learning about a growth mindset supported your confidence in being a leader and using leadership skills such as public speaking?
3. When developing your digital portfolio, what were some activities and/or assignments that supported you to better understand growth mindset and how it works with developing your leadership capacity?
APPENDIX D

FOCUS GROUP INTERVIEW PROTOCOL

Focus Group Interview Protocol

The focus group interview process will be during class time. The focus group will consist of all the 4th period 7th grade students participating in the innovation. The researcher will be using a smart phone app to record the full interview and will also be taking notes as discussing with participants.

Focus Group Interview 1:

1. If you could measure your confidence between 1 and 10 how confident would you say you are with speaking in front of your peers?

1. Who has used a digital portfolio, or other technology for projects in school? If so, what are some of the things you have used? Were they helpful? Why or why not?

2. What do you all think growth mindset is? Have you heard of it before? If so, what do you know about growth mindset?

Focus Group Interview 2:

1. How has growth mindset allowed you to make mistakes and/or feel more confident?

2. Do you feel more confident in presenting material because of what you have learned about having a growth mindset? Why or why not?

3. While developing your digital portfolio over this process, what activities helped you build your growth mindset? Why or why not?
APPENDIX E

SPEAKING SELF-EFFICACY SURVEY

Name: .................................................................

Gender: ...............  

Age: ............  

SD = strongly disagree; D = disagree; N = neutral; A = agree; SA = strongly agree

1 I have enough ability to improve my speaking skills.

2 I am sure that if I practice speaking more, I will get better grades in the course.

3 I can speak better than my classmates.

4 Even if the speaking task is difficult and I don’t have the required vocabulary, I can find the strategy to get the message across.

5 I am not stressed out when speaking English in the classroom.

6 I enjoy speaking with a proficient partner.

7 I am one of the best students in speaking courses.

8 I enjoy meeting tourists because I can speak with them well.

9 The more difficult the speaking practice is, the more enjoyable it is.
10 When the instructor asks a question, I raise my hand to answer it even if I’m not sure about it.

11 I'm confident about my ability to interact with other English speakers.

12 While speaking, I can deal efficiently with unexpected situations.

13 While speaking, I can remain calm when facing difficulties.

14 When I’m talking with fluent speakers, I let them know if I need help.

15 I'm confident I can communicate what I mean easily.

16 I feel confident that I can achieve a native-like accuracy in speaking.

17 I'm able to actively participate in my speaking classes.

18 I'm sure I can use English outside the classroom.

19 I believe I am a good English speaker.

20 I strongly believe that I can achieve native-like fluency in English.

21 I can describe my university to others in English.

22 I can tell a story in English.

23 I can ask my teachers questions in English.

24 I can produce sentence with idiomatic expressions.

25 I can introduce my teacher to someone else in English.

26 I can discuss subjects of my interest with my classmates.

27 I can introduce myself in English.

28 I can answer my teachers’ questions in English.
APPENDIX F

MINDSET ASSESSMENT PROFILE TOOL

Mindset Works® EducatorKit - Module 1 Toolkit

MINDSET ASSESSMENT PROFILE TOOL

For the Teacher: Using the Mindset Assessment Profile

This is a tool to get a quick assessment of your students’ mindsets—their beliefs about the malleability of intelligence, the relative importance of learning and perfect performance, and their attitudes toward effort and mistakes.

It’s important that students not feel labeled by this tool. The MAP categories just represent the way they are thinking and feeling about these questions at the present time. They can change these beliefs, and they may feel differently on different days.

You can use this assessment tool in a number of ways. For example, you can use it as an:

1) Individual assessment, scored by the teacher (with the result not shared with the student)
2) Individual assessment, scored by the teacher (with the result shared with the student)
3) Individual assessment, scored by the student
4) Individual assessment, scored by a peer

Once students have completed the assessment, you can follow up with discussions or activities to explore the issues raised. For example, you can:

- Identify students who scored in the fixed mindset range and discuss 1:1
- Ask students to select the statement where they had a Profile number of 1-3 (the “fixed mindset” range) and write or talk about it.
- Ask students to respond to question 4 about whether they feel the MAP description fits them.
- Have pairs of students exchange their profiles and discuss their beliefs.
- Present the overall percentage of students in each Profile category to the class.

Here are some questions that you might explore in any of the above formats:

- Are there some subjects where you don’t feel confident that you can learn and do well?
- How do you think it feels to get a bad grade if you believe that you can’t do any better?
- Can you think of a time when you learned to do something really hard? How did you learn it?
- What would you be willing to work hard to achieve if you knew it was possible?
- If you knew that you could develop your intelligence through effort, what goals would you set for yourself?
Creating Your Mindset Assessment Profile

1. First, determine your Profile Number for each question.
   - For questions with odd numbers (1, 3, 5, 7), write the number of your answer into the boxes in the right column.
   - For questions with even numbers (2, 4, 6, 8), use the table below to fill in the gray boxes in the right column.

<table>
<thead>
<tr>
<th>If you chose this answer:</th>
<th>Then write this number in the gray box on the right (Profile Number).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disagree A Lot (1)</td>
<td>6</td>
</tr>
<tr>
<td>Disagree (2)</td>
<td>5</td>
</tr>
<tr>
<td>Disagree A Little (3)</td>
<td>4</td>
</tr>
<tr>
<td>Agree A Little (4)</td>
<td>3</td>
</tr>
<tr>
<td>Agree (5)</td>
<td>2</td>
</tr>
<tr>
<td>Agree A Lot (6)</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Now, add up all your Profile numbers.
   - Add up all the numbers in the Profile column on the right, and write the total in the last box in the bottom right corner.

3. What does your Mindset Profile Number mean?
   - Find the group that includes your number in the chart below and circle it.
   - Now, read what it says about your MAP group.

<table>
<thead>
<tr>
<th>If your profile number falls into this range:</th>
<th>Then your MAP (Mindset Assessment Profile) group is:</th>
<th>People in this MAP group usually believe the following things:</th>
</tr>
</thead>
<tbody>
<tr>
<td>8-12</td>
<td>F5</td>
<td>You strongly believe that your intelligence is fixed—it doesn’t change much. If you can’t perform perfectly you would rather not do something. You think smart people don’t have to work hard.</td>
</tr>
<tr>
<td>13-16</td>
<td>F4</td>
<td>You lean toward thinking that your intelligence doesn’t change much. You prefer not to make mistakes if you can help it and you also don’t really like to put in a lot of work. You may think that learning should be easy.</td>
</tr>
<tr>
<td>17-20</td>
<td>F3</td>
<td>You are unsure about whether you can change your intelligence. You care about your performance and you also want to learn, but you don’t really want to have to work too hard for it.</td>
</tr>
<tr>
<td>21-24</td>
<td>F2</td>
<td>You believe that your intelligence is something that you can increase. You care about learning and you’re willing to work hard. You do want to do well, but you think it’s more important to learn than to always perform well.</td>
</tr>
<tr>
<td>25-28</td>
<td>F1</td>
<td>You really feel sure that you can increase your intelligence by learning and you like a challenge. You believe that the best way to learn is to work hard, and you don’t mind making mistakes while you do it.</td>
</tr>
<tr>
<td>29-32</td>
<td>G1</td>
<td></td>
</tr>
<tr>
<td>33-36</td>
<td>G2</td>
<td></td>
</tr>
<tr>
<td>37-40</td>
<td>G3</td>
<td></td>
</tr>
<tr>
<td>41-44</td>
<td>G4</td>
<td></td>
</tr>
<tr>
<td>45-48</td>
<td>G5</td>
<td></td>
</tr>
</tbody>
</table>

4. Do you think the description under your MAP group matches the way you think and feel about your school work? Which parts are true for you and which are not?
MINDSET ASSESSMENT PROFILE

This is NOT a test! It is an opinion survey about beliefs and goals regarding ability and performance. It is very important that you give your honest opinion, not what you believe someone else would think best. Read each statement, decide how much you agree or disagree with the statement, and circle your answer.

<table>
<thead>
<tr>
<th>Do you Agree or Disagree?</th>
<th>Disagree</th>
<th>Disagree</th>
<th>Disagree</th>
<th>Agree</th>
<th>Agree</th>
<th>Profile Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A Lot</td>
<td>A Little</td>
<td>A Lot</td>
<td>A Little</td>
<td>A Lot</td>
<td></td>
</tr>
<tr>
<td>1. No matter how much intelligence you have, you can always change it a good deal.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>2. You can learn new things, but you cannot really change your basic level of intelligence.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>3. I like my work best when it makes me think hard.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>4. I like my work best when I can do it really well without too much trouble.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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<tr>
<td>5. I like work that I’ll learn from even if I make a lot of mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>6. I like my work best when I can do it perfectly without any mistakes.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7. When something is hard, it just makes me want to work more on it, not less.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>8. To tell the truth, when I work hard, it makes me feel as though I’m not very smart.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
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</tbody>
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MINDSET ASSESSMENT PROFILE NUMBER
**Mindset Assessment Profile Tool**

**Description:** Survey for getting a quick assessment of your students’ mindsets

**Objective:** Students will complete survey and (optional) reflection

**Timeline:** 10-30 minutes

**Instructions:**

- Explain to the students that they are about to take a survey. A survey is a tool to gather information—in this case, your opinions about intelligence, performance, learning, effort, and challenges. It may look like a test or quiz, but in fact it is not! Answer honestly and say what you believe. There will be no grade attached to the survey and the “score” you receive is not a percentage correct. Afterwards, we will discuss the questions and the different ways that people think about them.
- Have students answer the survey questions. This can be done anonymously if desired.
- You may opt to have students self-score, or not.
- You may choose to engage students in reflection through writing or discussion.

**After the survey**

Make sure that you emphasize that the survey is a gauge (like taking a temperature with a thermometer) of their thinking right now. As we learn new things, our thinking changes. The survey is not intended to be a way to label students, but rather to get to the core of their thinking so that new learning can occur.

**Optional Reflection/Discussion**

Debrief with your class after they complete the survey. Ask:

- Were there any questions that surprised you?
- Which questions were difficult to answer? Why?
- Are there any questions that you were glad to have been asked?
- Are you excited to learn more about this topic? Why/Why not?
## APPENDIX G

Innovation Lessons

Table 6.1 *Organization of Innovations*

<table>
<thead>
<tr>
<th>Lesson/Module</th>
<th>Topics/Objectives</th>
<th>Activities</th>
<th>Timeline</th>
<th>Digital Portfolio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 1 Mindsets</td>
<td>The Introduction to Brainology® presents the curriculum and its purpose, the characters that will guide students throughout the program.</td>
<td>MAP tool (PRE)</td>
<td>Week 1 &amp; 2 Tuesdays and Thursdays</td>
<td>Develop a digital portfolio in google sites, Users also create an inventory of their personal challenges so they can more easily relate the Brainology® lessons to their lives. Make a home page with a link to your MAP score and a link to the article with your reflection. Add to Google sites a new page reflecting students understanding and learning about the brain.</td>
</tr>
<tr>
<td>Module 2</td>
<td>Basics of brain structure and function. This unit also explains what is required to maintain readiness to learn and how attention and concentration are</td>
<td>Online and teacher led activities: Connect it, check it, Practice it, Apply it.</td>
<td>Week 3 &amp; 4 Tuesdays and Thursdays</td>
<td></td>
</tr>
<tr>
<td>Lesson/Module</td>
<td>Topics/Objectives</td>
<td>Activities</td>
<td>Timeline</td>
<td>Digital Portfolio</td>
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<td>supported. This unit teaches students the physical aspects of thinking and learning, which underlie a growth mindset.</td>
<td>Online and teacher led activities: Connect it, check it, Practice it, Apply it.</td>
<td>Week 5 &amp; 6 Tuesdays and Thursdays</td>
<td>thinking and learning.</td>
</tr>
<tr>
<td>Module 3</td>
<td>Brain Behavior teaches students that the brain functions by sending chemical messages through a network of nerve cells, and that these cells are responsible for thought. This insight provides a foundation for understanding how learning changes the brain. Students also learn how emotions can influence the brain and are taught strategies for managing their negative emotions and enhancing their positive ones.</td>
<td></td>
<td></td>
<td>Develop a page on google sites page that can explain brain behavior using visuals, research and understanding to share out on your webpage.</td>
</tr>
<tr>
<td>Module 4</td>
<td>Brain Building fosters students’ discovery of how learning changes the brain. They learn that through repeated practice, connections in neural networks grow. This is the key to the growth</td>
<td>Online and teacher led activities: Connect it, check it, Practice it, Apply it.</td>
<td>Weeks 7 &amp; 8 Tuesday and Thursdays</td>
<td>On the digital portfolio page students will share out their findings from a scientific research study by creating a</td>
</tr>
<tr>
<td>Lesson/Module</td>
<td>Topics/Objectives</td>
<td>Activities</td>
<td>Timeline</td>
<td>Digital Portfolio</td>
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<tr>
<td>Module 5</td>
<td>mindset. Students learn that intelligence can be developed through mental exercise, and they are introduced to activities that promote learning.</td>
<td>Online and teacher led activities: Connect it, check it, practice it, Apply it. MAP tool (post) Self-Efficacy Survey (post)</td>
<td>Weeks 9 &amp; 10</td>
<td>Students will post a brain study plan page on their digital portfolio and finalize their portfolio for submission and feedback from peer and teacher.</td>
</tr>
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</table>