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Effect of Classroom Interactions and Instructional Practices on Mindset Development and Students' Attitude Toward Challenges

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Abstract

This mixed-methods study explored the relationship between growth and failure mindset with a student's attitude toward challenge and the ecological factors in the classroom that lead to mindset development. The study included both a survey and individual student interviews. For the study, one school was with a low percentage of students with free or reduced lunch (10%–30%), one with a high percentage of free or reduced lunch (60%–95%), and one with an average percentage of students with free or reduced lunch (31%–59 %). A principal component analysis (PCA) was run to examine and analyze the survey items. The quantitative study set out to determine the impact of growth and failure mindset on a student's attitude to challenge and examine how feedback within that context would influence that mindset development. For both, correlations the null hypothesis was not rejected. A qualitative portion gathered student insight on the instruction, interactions, and feedback that occur in classrooms that allow them to see failure as a positive step in the learning process. The study included 15 interviews that showed middle school students understand that mistakes and setbacks are a part of learning. It also highlighted that very few students had experiences in the classroom that helped them learn from those mistakes to become stronger learners. Common themes included: classroom instruction that embraces exploration and failure, quality of feedback; evaluation and grading practices; and time.

Keywords: growth mindset, failure mindset, ecological factors, growth mindset pedagogy, middle school

Dedication

To my former students in Savarekareka—you were there as I began my journey in education and taught me all the important lessons I know.

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The journey through this program has been a transformative experience. I am thankful for each of the professors that I met along the way. Each, and every, one of them helped me grow and stretch myself beyond my expectations.

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Chapter 1: Introduction

Introduction

The transition from elementary to middle school has been shown to be a critical period in the development of early adolescent learners (Blackwell, Trzensniewski, & Dweck, 2007). The differences between the two unique educational settings indicate the presence of ecological factors that impact a student's self-concept and perception of themselves as learners, including larger school size, higher grading standards, less time to develop strong relationships with teachers, increase in ability grouping and comparisons, and less autonomy (Eccles et al., 1993; Gniewosz, Eccles, & Noack, 2012). The relationship between these environmental factors and the developmental needs of early adolescents is explained through the stage–environment fit theory (Eccles & Midgley, 1991).

The transition from elementary school to middle school is a difficult one as students move from a single classroom to a learning environment that seems increasingly impersonal and competitive and developmentally unresponsive (Ellerbrock & Kiefer, 2013). The result is often a decrease in engagement, motivation, and achievement that can be a predictor for future academic development (Roeser & Eccles, 1998). The culture of the classroom and school has a significant impact on student engagement and academic success (Quin, Heerde, & Toumbourou, 2018). During middle school, students experience change, challenges, and setbacks, and their psychology or mindsets play a critical role in their development and success as learners (Rattan, Savani, Chugh, & Dweck, 2015).

This study sought to examine the ecological factors that influence a student's willingness to embrace challenges and whether they view failure as an enhancing or debilitating experience. Furthermore, in the context of the classroom, this research examined how educator feedback and

instructional practices promote a focus on learning. This mixed methods study has expanded the current understanding of the impact of teacher feedback and instructional practices on student mindset. Mindset and the culture of the learning community form the link that increases the fit between the developmental stage of the student and their environmental factors (Booth & Gerard, 2014).

Problem Statement

Creating a school environment that meets the students' developmental needs is key to increasing the students' cognitive and noncognitive attributes (Pyne, Rozek, & Borman, 2018). These attributes lead to high self-perception and self-efficacy and an increase in achievement (Gniewosz et al., 2014). However, the problem arises in relation to the way in which this is executed in schools (Booth & Gerard, 2014). Decline in engagement and achievement persist despite interventions and the current understanding of early adolescent development (Blackwell et al., 2007; Symonds & Hargeaves, 2016). Often excluded here is the crucial relationship between the teacher and the student and the context of the classroom, which is established through feedback and instructional practices (Barnes & Fives, 2016; Schmidt, Shumow, & Kacker-Cam, 2015).

This study aimed to explore the ecological factors of the classroom that impact student growth, failure mindset, and the students' attitude toward challenges. Multiple studies, which will be discussed in Chapter 2, demonstrate the buffering effects of the growth mindset on aspects of early adolescent development that may result from a lack of a stage–environment fit (Burnette, O'Boyle, VanEpps, Pollack, & Finkel, 2013; Rattan et al., 2015). This study examined how instructional practices and feedback facilitate the development of a mindset that embraces challenges and sees failure as an enhancing experience. Understanding that the feedback students

receive from teachers and parents plays a significant role in the development of their mindset, the secondary goal was to identify the instructional practices and messages students receive from teachers that cultivate a "failure-is-enhancing" mindset and enable the students' ability to work through failure.

Nature of the Study

A student's academic mindset has been shown to improve their academic emotions and achievement (Rattan et al., 2015). An increase in positive academic emotions translates to a decrease in anxiety and an increase in self-esteem and resilience (Eccles, 2004; Schleider & Weisz, 2018). These noncognitive factors have been shown to represent a student's well-being, their comfort in school, and their concept of themselves as a learner (Pyne et al., 2018). Students with a growth mindset view the transitional challenges as an opportunity to grow (Romero et al., 2014). Their resilience allows them to view changes in school environments as a unique opportunity to learn and build new skills by trying out new strategies and receiving feedback regarding the same. The belief that intelligence is malleable helps students see the school environment as safe and supportive.

The results of this study were examined through the conceptual framework stage–environment fit theory (Eccles et al., 1991). While seeking the link between growth, failure, mindset, and the degree to which the school fulfills the developmental needs of early adolescents, this researcher examined the ecological factors of the classroom that facilitate mindset development. Those factors included interactions, feedback, and instructional practices. Research has focused on developing mindset through intervention, revealing that a growth mindset can be cultivated. In addition to changing, student mindset studies have shown that context is important. Interventions and feedback built into the culture of the learning community

allow students to internalize the belief that intelligence is malleable. The feedback students receive from adults within that context plays an important role in helping them develop a growth mindset and determining how students will view challenges and failure (Haimovitz & Dweck, 2016; Schmidt et al., 2015).

This study contributed to the current body of research by extending our understanding of adult feedback in times of failure. A mixed methods research approach was used in this study to allow the researcher to gain a stronger understanding of academic mindsets and the interactions and events in a classroom that impact students' mindset. This study examined the correlation between mindset, growth and failure, and a student's attitude toward challenges. It also focused on the context of the classroom, looking at the impact of teacher feedback on a student's focus on learning quantitatively. The qualitative portion of the study allowed the researcher to identify the instructional practices that help students develop a failure-is-enhancing mindset. Together, the quantitative and qualitative findings of the study will allow educational practitioners and policymakers to understand how the mindset of the individual is related to the interactions and instructional practices of the classroom. These relationships, viewed through the lens of the stage–environment fit theory (Roeser & Eccles, 1998), will provide insight into how schools can work to better meet the developmental needs of students.

Research Questions and Hypotheses

This study focuses on the impact of the growth mindset on a student's attitudes toward challenges. In this study, the researcher is particularly interested in the instructional practices and messages teachers could use to help students develop a failure-is-enhancing mindset to improve the stage–environment fit (Eccles et al., 1991) for early adolescents as they transition from elementary to middle school. The following research questions will guide this study:

Research question 1. Is there a relationship between middle school students' growth mindset and their attitude toward challenge?

H_{O1}**.** There is no relationship between middle school students' growth mindset and their attitudes toward challenges.

H_{A1}**.** There is a positive relationship between middle school students' growth mindset and their attitudes toward challenges.

Research question 2. Is there a relationship between middle school students' failure mindset and their attitudes toward challenges?

H_{O2}**.** There is no relationship between middle school students' failure mindset and their attitudes toward challenges.

H_{A2}**.** There is a positive relationship between middle school students' failure mindset and their attitudes toward challenges.

Research question 3. Do the strategy messages received by middle school students during a setback impact the focus of learning?

H_{O3}**.** The strategy messages received by middle school students during a setback do not impact the focus of learning.

H_{A3}. The strategy messages received by middle school students during a setback impact the focus of learning.

Research question 4. How do instructional practices influence and promote the failure-is-enhancing mindset in students?

a. Based on student's lived experiences, which instructional practices facilitate a failure-is-enhancing mindset?

b. What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

Purpose of the Study

The purpose of this study is to examine the correlation between mindset and a student's attitude toward challenges while taking into account the role of the classroom in mindset development. The targeted population for this study is the seventh-grade population in middle schools across the survey area. The students were surveyed at the beginning of their seventh-grade year to assess their growth and failure mindsets, attitude toward challenges, and responses to feedback after 1 year in the middle school setting. The research design outlined in Chapter 3 examines the impact of the growth and failure mindsets on a student's attitude toward challenges as well as the context of the classroom that facilitates mindset development. This study examined the impact of interactions within the classroom, through teacher feedback, and the instructional practices that support a student's focus on learning and view of failure as an enhancing experience.

Conceptual Framework

From biological changes to social changes and the structural changes that occur in the learning environment as they transition from elementary to middle school, early adolescence is a period of significant change for students (Eccles et al., 1993; Gniewosz et al., 2012). As students move to middle school, they encounter higher expectations, a greater focus on grades and ability grouping, and standardized teaching and learning practices (Eccles et al., 1993). Changes in the learning environment have been shown to impact student's self-concept, motivation, and academic trajectory (Eccles et al., 1991). A disconnect between the developmental needs of early adolescents and the structures and policies of traditional middle schools has a negative impact on

the self-concept and achievement of students (Ellerbrock & Kiefer, 2013). Such a disconnect between the developmental stage and the learning environment is explained by the stage–environment fit theory (Eccles, Lord & Midgley, 1991).

The data collected in this study was examined through the lens of the stage–environment fit theory (Eccles et al., 1991). According to this model, traditional schools that organize students by ability level and promote competition become an isolating environment for middle school students. This leads to a decrease in motivation, engagement, and achievement (Roeser & Eccles, 1998). This is known as a lack of fit. Schools that accommodate students, allow autonomy, foster strong peer relations, promote collaboration, and build positive teacher interactions can be said to have a high degree of stage–environment fit.

Building a positive culture of learning must be a priority in schools. The findings of this study will help educators and schools understand the correlation between academic mindsets and a student's attitude toward challenges. Recognizing the significance of the classroom culture and the interactions that occur there, this study would strive to include student voice to identify the feedback, interactions, and instructional practices that help early adolescents take on challenges and persist through struggles. By creating student-centered classrooms that incorporate peer and teacher feedback and reinforce effort, our schools can successfully meet the developmental needs of students, thereby, increasing the stage–environment fit (Barnes & Fives, 2016; Schmidt et al., 2015).

Operational Definitions

Stage–environment fit. Stage–environment fit theory describes the fit, or lack of fit, between early adolescents and their changing social environment as they transition from elementary to middle school (Roeser, 2005). The stage refers to the developmental needs of early

adolescence (Eccles et al., 1991). The environment is defined as the school and classroom setting. In traditional middle school environments, they found an emphasis on competition, social comparison, and ability self-assessment (Eccles et al., 1993), which signals misalignment with the appropriate stage for adolescents—a lack of fit.

Strategy messages. This variable includes the informal feedback teachers give students. The study examined the impact that strategy feedback, and not comfort, has on student mindset and their focus on learning. Strategy messages, in this study, ask students to reflect on the strategies they used in the learning process and examine alternative steps that can be taken to master the skills needed to be successful in the future (Rattan, Good & Dweck, 2012).

Growth mindset. In this study, growth mindset is defined as the student's view of intelligence as malleable (Dweck, 2006). Dweck classified implicit theories of intelligence, on the basis of an individual's unconscious belief of their ability, as either growth mindset or fixed mindset. Students with a growth mindset believe that with persistent effort, effective strategies, and feedback from others, intelligence can be developed over time.

Failure mindset. Failure mindset is a unique construct that is not associated with a fixed mindset. Individuals with a fixed mindset view intelligence as unchangeable. In this study, failure mindset is defined by a student's belief regarding the role of failure in the learning process. Haimovitz and Dweck (2016) identified two types of failure mindsets: failure-is-enhancing and failure-is-debilitating. A student with a failure-is-enhancing mindset sees challenges and failure as part of the learning process that will help them extend their understanding and improve outcomes.

Attitude toward challenges. For this study, attitude toward challenges is defined as a student's ability to follow an interest and take on an academic challenge that would require

extended effort (Aditomo, 2015). The ability to overcome a setback, work hard, and persist until the end is also included in this variable (DeCastella & Byron, 2014).

Focus on learning. This study examines the connection between feedback and a student's focus on learning. In this study, focus on learning is defined as a student's growth and failure mindset within a context and the student's perception of the learning environment. A student's focus on learning can be measured using a survey tool that takes into account a student's view of themselves as a learner in the classroom environment and their growth and failure mindset within the same context.

Assumptions, Limitations, and Delimitations

While making decisions on the research design, it is important for the researcher to identify the decisions or aspects of the study that may impact the outcomes. These assumptions, limitations, and delimitations are introduced here and will be discussed in greater detail in Chapter 3.

Assumptions. When collecting and analyzing data in this study, the researcher worked with a set of assumptions. Prior to calculating the Pearson's r correlation or running an ANOVA, the data were analyzed to test the following assumptions: a randomization of the samples, a normal distribution of experimental errors, equal variance between the treatments, that the variables are continuous with a linear relationship, and that there are no outliers (Ayiro, 2012). The examination of the assumptions allowed this researcher to explore the potential accuracy of student responses in the self-reporting format of the survey.

Limitations. Limitations are the factors in a study that are out of the control of the researcher and may potentially affect the findings of the study (Simon, 2011). Limitations in this study may be concerned with the following factors: (a) the districts and schools that agree to take

part, (b) the students and families who give consent to take part, and (c) the instrumentation of the survey tool.

Delimitations. Delimitations are factors that the researcher decides may impact the outcomes of a study (Simon, 2011). The researcher has identified the following delimitations: (a) the self-reporting format of the survey, (b) the open-ended qualitative questions included in the survey, and (c) data analysis, which describes correlation rather than causation.

Significance of Study

This study aims to examine the ecological factors of the learning environment in the classroom to learn about the interactions and instructional practices that help students develop a failure-is-enhancing mindset. The transition from elementary to middle school is associated with a decline in self-efficacy, engagement, and achievement (Burnette et al., 2013). The information gathered from seventh graders reflecting on their first year of middle school provided insight into the factors that help students embrace challenges and persist through setbacks. Much of the research described in Chapter 2 highlights the effects of mindset interventions—actions that were taken outside of the classroom setting, taking into consideration the important relationship between student and teacher. This study aims to highlight the interactions and practices within this relationship helps student mindset development.

The results of this study provide educators insight into the relationship between growth and failure mindset and a student's attitude toward challenges. It sheds light on some aspects of the culture of the classroom; interactions and instructional practices influence a student's mindset through feedback and instructional practices. The findings of this study indicate ways in which educators and schools can provide developmentally appropriate support to early adolescents transitioning to middle school.

Summary

The purpose of this study is to examine the impact of a student's growth mindset, their attitude toward failure, and their attitude toward challenges while examining the academic environment of the classroom that facilitates mindset development. The mixed methods research design examined the impact of growth and failure mindsets on a student's attitude toward challenges as well as the context of the classroom that facilitates mindset development. This allowed the researcher to gain an understanding of the culture of the classroom as described by seventh graders in their science classroom. The student narrative allowed this researcher to examine the impact of interactions in the classroom through teacher feedback and the instructional practices that support a student's focus on learning and the view of failure as an enhancing experience.

The following chapters provide a review of the current literature and outline the study and data analysis procedures. Chapter 2 outlines the current research on growth and failure mindset, highlighting the need for this study. Chapter 3 describes the mixed methods design, including a detailed description of the sample as well as the analysis used to make meaning of the data collected. The data of both quantitative and qualitative portions of this study will be presented, and the findings of this study are summarized in Chapter 4. Chapter 5 provides a summary and discussion of the results, their implications, and a call to future research.

Chapter 2: Literature Review

Introduction

As early adolescents begin to experience the physiological changes that accompany puberty, there is a change in their learning environment as they transition from elementary to middle school. The differences between these two settings highlight ecological factors that impact students' self-concept and perception of themselves as learners (Roeser & Eccles, 1998). These ecological factors include larger school size, higher grading standards, less time to develop strong relationships with teachers, increase in ability grouping and comparisons, and decline in autonomy; all these factors influence the development of a student's academic self-concept (Eccles et al., 1993; Gniewosz et al., 2012). For instance, research has shown that a negative self-concept of academic ability is associated with low academic achievement, motivation, and engagement and higher levels of truancy, maladaptive behaviors, depression, and anxiety (Roeser & Eccles, 1998). Environmental factors such as the amount of teacher control versus student autonomy, teacher warmth, evaluation practices, opportunities for student interaction, and a focus on self-evaluation are some observable measures that increase the fit between the students' developmental stage and the learning environment (Eccles et al., 1993). The alignment between these environmental factors and the developmental needs of early adolescence is explained through the stage–environment fit theory (Eccles et al., 1991), which identifies this stage as a developmental milepost and takes into consideration the needs of early adolescents and the environment as the classroom (Eccles et al., 1991).

Dweck (2006) introduced the concept of growth and fixed mindsets. Growth mindset, also known as an incremental theory of intelligence, is the concept wherein individuals may hold one of two beliefs about intelligence and their own abilities. A fixed mindset, also known as the

entity theory of intelligence, is a concept that explains how students perceive their own talent and IQ as predetermined, believing there is little they can do to change it. A fixed mindset differs from growth mindset in the degree to which students appraise events in relation to themselves, particularly for one's own perceived competence (King, 2012). On the other hand, with a growth mindset, the individual believes that abilities can be developed through hard work, good strategies, and instruction from others (Blackwell et al., 2007; Paunesku et al., 2015). Dweck (2006) explained that individuals with a growth mindset see failure as an opportunity to learn and grow. King (2012) stated that those with a growth mindset are more likely to be buffered against the emotional consequences of failure and, therefore, may be able to better navigate the environmental changes experienced during the transition from elementary to middle school. Growth mindset has a moderating effect on many of the struggles students experience as they transition from elementary to middle school; it can, therefore, be used a tool to increase the stage–environment fit.

Study Topic

Academic beliefs and values undergo substantial change during the school transitions adolescent's experience (Eccles et al., 1993). Due to the significant impact on student achievement and academic trajectory, researchers have highlighted these early adolescent years as a critical point in development (Blackwell et al., 2007). Multiple studies have demonstrated the buffering effects of growth mindset on several aspects of early adolescent development that may result from a lack of stage–environment fit (Rattan et al., 2015; Burnette et al., 2013). Formative research includes the work of King, McInerney, and Watkins (2012), who examined the positive correlation between fixed mindset and negative academic emotions; Dinger and Dickhauser (2013) studied the relationship between growth mindset and student's mastery goal

development; Yeager and Dweck (2012) highlighted how growth mindset helps students meet the challenges of school by promoting resilience.

Studies highlight the circumstances wherein students have been better served by classrooms that focus on process over product, on learning versus success, and on creating the nurturing and supportive learning environment early adolescents need (Blackwell et al., 2007). This study examined the impact of the teacher in the classroom and examine the instructional practices and feedback that impact a student's growth mindset. The researcher focused specifically on student willingness to embrace change, whether they view failure as an enhancing or debilitating experience, and how the educators' practices promote a focus on learning. This study is significant because it furthers the understanding of the impact of teacher feedback and instructional practices on student mindset. Mindset, and a culture of mindset, within a classroom learning community become the link that increases the fit between the developmental stage of the student and environmental factors.

Context

The importance of classroom interactions between teacher and student through instructional practices and feedback has been highlighted both in the stage–environment fit data and studies examining growth mindset (Hochandel & Finamore, 2015; Symonds & Hargeaves, 2016). Dweck (2006) described the importance of high standards and a nurturing environment; teachers need to provide clear, specific, and honest feedback to students while also offering solutions and strategies to help them improve and grow. Haimovitz and Dweck (2017) examined the ways in which adults impact the mindset development of adolescents and how socialization occurs. While an adult's mindset does not directly influence a child's, Haimovitz and Dweck found that process-focused teaching and classroom culture are essential, as are a teacher's

response to success and failure. In their study, Schmidt et al. (2015) examined the impact of a teacher's mindset on the outcomes of a growth mindset intervention. There were significant differences in the results of a growth mindset intervention that can be attributed directly to the classroom teacher. Teachers with growth mindset incorporate practices, reteaching, and references into their daily work, which helps students internalize an incremental view of intelligence.

Significance

The significance of this study is in bettering the understanding of the impact of instructional practices and feedback on student development. The transition to middle school is a critical phase in early adolescent development as it influences students' self-concept and the eventual trajectory of their educational career (Blackwell et al., 2007; Brummelman & Thomaes, 2017). Identifying the messages and feedback along with instructional practices that help students develop a growth mindset and perceive failure as an opportunity to grow allows practitioners a way to improve the stage–environment fit by altering the ecological factors in their classrooms.

Problem Statement

The two areas of growth mindset that this study focused on were the student's willingness to embrace challenges and the instructional practices that help develop a failure-is-enhancing mindset and promote a focus on learning (Haimovitz & Dweck, 2017; Oyserman, Elmore, Novin, Fisher, & Smith, 2018). Students' willingness to embrace challenges can be defined or demonstrated by brainstorming, using a few different strategies to solve a problem, seeking feedback, and using this information to make adjustments to the final products (Dweck, 2006). A failure-is-enhancing mindset can be demonstrated by a student response that recognizes that

failure promotes learning, performance, and growth (Haimovitz & Dweck, 2017). Explicitly teaching thinking strategies allows early adolescents to develop the skills to work autonomously and collaboratively with peers (Rattan et al., 2015). The focus on school and classroom practices provides a more appropriate stage–environment fit, as described by Eccles (2004).

The research illustrated the benefits of introducing a culture of growth mindset, demonstrating cases where this change in mindset has led to an increase in motivation, engagement, and achievement (Dweck, 2006; King, 2012). Studies suggest that a classroom or school that adopts growth mindset and focuses on process over product while improving its students' noncognitive factors may be able to alter the structure of the traditional middle school, creating a community that supports the needs of early adolescents (Blackwell et al., 2007; Pyne et al., 2018). These efforts will improve the fit between the stage and environment, helping them through this transition while maintaining the inquiry-based attitude that embraces the challenge and perseverance they had in late childhood (Blackwell et al., 2007).

While a great deal of research has been done on interventions, few studies have examined the role and impact of the educator in the classroom. A large portion of the available research focuses on the responses to success that students experience (Haimovitz & Dweck, 2017). There is a need to focus on the feedback students receive as a result of setbacks and failure (Haimovitz & Dweck, 2017). While some studies hint at the power of helping students develop a failure-is-enhancing mindset, there is a need to understand the context of the classroom, the interactions within it, teacher feedback, and the instructional practices that help students see the positive nature of failure and gain the skills necessary to reflect and revise as they extend their learning. The current study explored how instructional strategies, assessment, and feedback from teachers

instill a growth mindset, promote a focus on learning, and enable students to persist through struggle.

Organization

The review of literature begins with a review of growth and fixed mindsets (Dweck, 2006). The researcher then examines the links between mindset and the internal and external ecological factors that students encounter during the transition to middle school and the link between mindset and student behavior, academic motivation, and self-concept. From there, the review will lead to an examination of mindset and its potential impact on stage–environment fit.

Second, the literature review explores how mindset can be developed by reviewing results-focused intervention research on academic achievement and classroom culture. The review includes research that focuses on the feedback students receive from the adults they encounter, particularly teachers. Feedback plays a vital role during this transition between elementary school and middle school in the student's development of self-concept (Gniewosz et al., 2012), mindset, and academic emotions (King et al., 2012).

Finally, the literature review takes a closer look at failure mindset, examining the feedback early adolescents receive and its impact on mindset, willingness to embrace challenge, and focus on learning. The work of Haimovitz and Dweck (2016) frames the literature review and research questions, which examine the impact of teachers' practices and feedback on students.

Conceptual Framework

Early adolescence is a period of significant change. Students undergo biological changes during puberty, social changes due to dynamic and changing relationships with family and friends, and structural changes as they move from elementary to middle school, all at the same

time (Eccles et al., 1993; Gniewosz et al., 2011). During the normative change to middle school, students enter a world of higher expectations, greater focus on grades, and more ability-based grouping and standardized teaching and learning practices (Eccles, 2004). The changes in the learning environment have been shown to impact student's self-concept, motivation, and academic trajectory (Eccles et al., 1991). Dweck (2006) described the impact of growth mindset on students' engagement, persistent effort, and ability to work through a challenge. Students who believe intelligence to be malleable see the challenge of transition as an opportunity to learn and grow. As described below, the stage–environment fit theory (Eccles et al., 1993) will act as the primary overarching conceptual model, and the Mindset Theories of Intelligence (Dweck, 2006) will act as a secondary narrow theoretical framework to guide this study.

Stage–environment fit theory. Eccles et al. (1991) described a decrease in motivation, engagement, and achievement through the stage–environment fit theory. The theory was developed in 1989 when Eccles and colleagues researched the fit, or lack thereof, between early adolescents and their changing social environment as they transitioned from elementary to middle school (Roeser, 2005). In this model, the stage refers to the developmental needs of early adolescence. These developmental needs include the need a non-comparable and non-competitive academic setting, opportunities for autonomy and decision-making, an emphasis on collaboration and peer relationships, and extended contact with teachers (Eccles et al., 1991). The environment is defined as the school and classroom setting. In traditional middle school environments, Eccles et al. (1993) found an emphasis on competition, social comparison, and ability self-assessment, which signaled a misalignment with the stage appropriate for adolescents.

According to this model, the policies and practices at many middle schools represent a disconnect between developmental needs and the educational setting, or a lack of fit (Eccles et al., 1993). Traditional schools that organize students by ability level promote competition, creating an isolating environment for middle school students, which leads to a decrease in motivation, engagement, and achievement (Roeser & Eccles, 1998). However, schools that make accommodations to meet the developmental needs of students by providing autonomy, fostering strong peer relations, promoting collaboration, and building positive teacher interactions can be said to have a high degree of stage–environment fit (Roeser & Eccles, 1998). The authors conclude that student-centered conditions lead to an increase in student self-concept, and an increase in motivation and mastery of goals helps students meet their academic potential, representing a high degree of fit (Roeser & Eccles, 1998).

Building on the seminal model. Researchers have used the stage–environment fit theory to examine students and their school environment (Gniewosz et al., 2012). For instance, Symonds and Hargreaves (2016) examined two variables that impact stage–environment fit, engagement, and socialization. The study aimed to determine which variables had the most significant influence on the emotional and motivational engagement of students. The researchers concluded that relationships in the classroom with teachers and peers were the most significant stage–environment interactions. They suggested that teacher interactions provided for an opportunity for autonomy and self-directed learning. The lack of these factors in the classroom, according to the researchers, led to much of the decline in the transition to middle school, which can be attributed to teachers and instruction. Peer relations and opportunities to collaborate and make meaning of the lesson may alleviate this demotivation. Small changes to instructional practices could significantly increase the degree of fit in an educational setting.

Building a positive culture of learning is a priority. According to Eccles et al.'s (1991) model, a school culture that sees intelligence and other characteristics as malleable will encourage students that take academic risks, show resilience in the extended effort, and seek feedback. Student-centered classrooms that incorporate peer and teacher feedback and reinforce effort will more likely be successful in meeting the developmental needs of students, thereby, improving the stage–environment fit (Barnes & Fives, 2016; Schmidt et al., 2015).

Implicit theory of intelligence. The results of this study were examined through a second lens—the implicit theory of intelligence. This secondary lens allowed for the exploration of the mindset, instructional practices, and feedback that impact the stage–environment fit of a learning community. Dweck (2006) classified the implicit theories of intelligence, and an individual's unconscious belief of their ability, as either growth mindset or fixed mindset. Individuals with a fixed mindset, or an entity theory of intelligence, see intelligence as fixed. According to these individuals, intelligence cannot be developed or increased; abilities do not improve over time or with extended effort.

On the other hand, individuals with growth mindset, also known as the incremental theory of intelligence, view intelligence as malleable. Individuals with a fixed mindset see grades, competition, and feedback in middle school as a judgment and a label. The decline in achievement, demotivation, disengagement, and anxiety that Eccles et al. (1991) described follows. Lack of trying for early adolescents is not about learning but protecting their ego. For students with a fixed mindset, the labels and judgment traditional school environments involves create a need for them to disengage and protect themselves (Dweck, 2006).

For early adolescents, increased effort, effective strategies, and feedback from others can improve intelligence, strengthen skills, and increase abilities (Dweck, 2006). Research supports

the positive impact of growth mindset on many areas of the school experience. Yeager and Dweck (2012) examined how growth mindset affects the malleability of the academic and emotional characteristics of students. They found that short, concise, and age-appropriate interventions can develop a growth mindset and resilience in all students of all ages. The interventions show a significant impact on a student's willingness to face challenges, academic achievement, and resilience in the face of social isolation.

Further, King (2012) examined the link between an implicit theory of intelligence and global well-being and adjustment outcomes. The results demonstrated that students with the belief that intelligence is malleable experience more positive emotions, self-esteem, and harmonious relationships in school. Other researchers have studied the impact of growth mindset on intrinsic motivation (Haimovitz et al., 2011), academic achievement (Blackwell et al., 2007), and anxiety (Schroder et al., 2017) and the moderating effect of poverty on achievement levels (Claro, Paunesku, & Dweck, 2016) and the ability to negate stereotype threat (Rattan et al., 2015). According to these findings, developing an understanding of the malleability of intelligence can tackle many of the challenges faced by students and potentially our schools.

Challenges

This study examined how an environmental culture of growth mindset as well as instructional practices and feedback can improve the developmental appropriateness of our middle schools. Haimovitz and Dweck (2017) proposed that it is not the mindsets of the adults working with children who develop growth mindset but, instead, their behavior of increasing the motivation and engagement of their students. Haimovitz and Dweck (2016) found that parents' beliefs about failure, as a debilitating or enhancing event, predict a child's mindset. In other words, a parent's failure mindset impacts their view of their child's academic potential, which

influences their reaction and guidance in the case that their child faces failure. This reaction and the subsequent guidance directly impact the child's mindset. If parents view struggle or failure as an opportunity to learn, they possess a failure-is-enhancing mindset. The feedback they give their child during this time will focus on learning. The results of this study demonstrated that children had a greater likelihood of developing growth mindset (Haimovitz & Dweck, 2016).

In their research, Shim, Cho, and Cassady (2013) examined the impact of the teacher in growth mindset interventions. They found that the teachers' practices and discourse impacted the intervention on the student's sustained growth mindset and academic achievement. In other words, beyond the intervention, it was the daily interactions between teachers and students that increased the students' focus on effort and learning. The current study expands the focus on teachers to examine which instructional strategies, interactions, and messages demonstrate to students the value of failure as a learning experience and promote a culture of embracing challenges.

The environment of the school or classroom is determined by the established instructional strategies and protocols (Ellerbrock & Keifer, 2013). These systems have been established by the adults in question (in this case, the teachers) who establish the instructional practices incorporated in the learning process and interactions with individual students. These systems, practices, and interactions directly impact early adolescents and their mindset. This study examined the practices and interactions of the teacher to determine their impact on student mindset and willingness to embrace change (see Figure 1). Teacher feedback and instructional practices was then be viewed through the lens of the stage–environment fit theory to determine if those interactions play a moderating role in creating a bridge between the developmental stage and the new middle school learning environment.

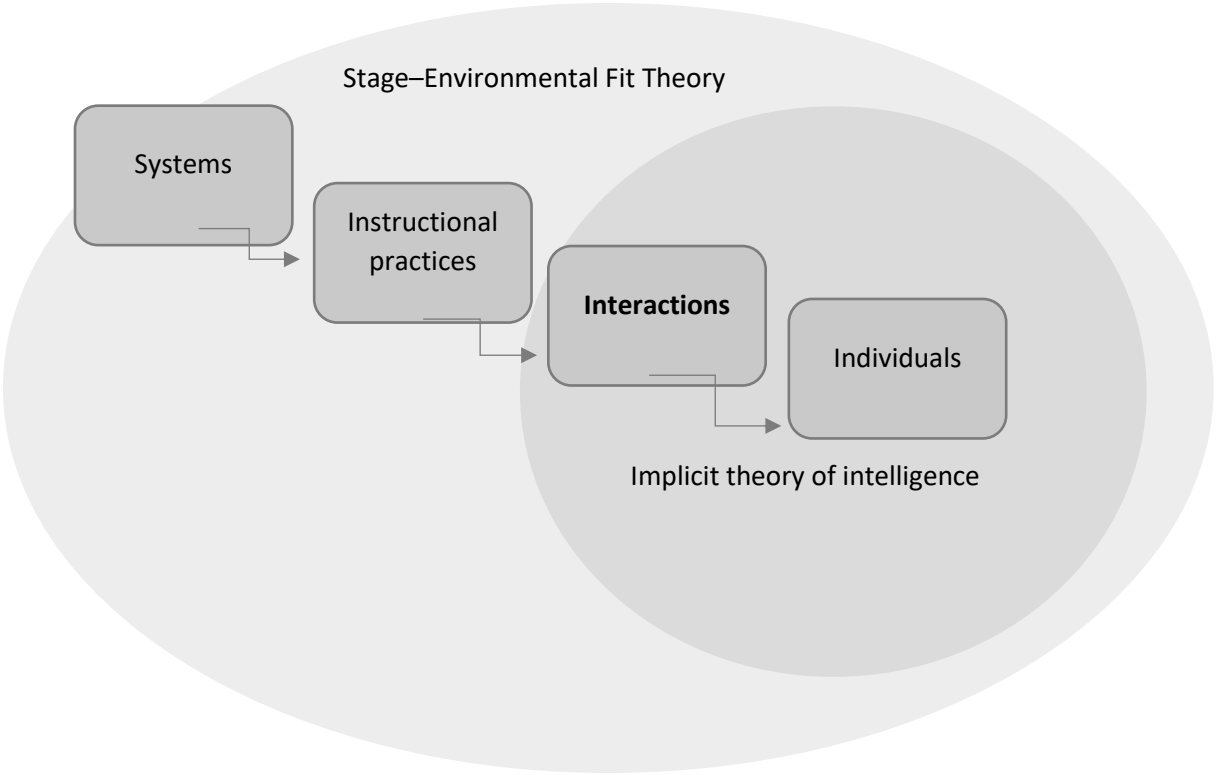

Figure 1. Conceptual **f**ramework.

Growth Mindset and Fixed Mindset

The implicit theories of intelligence allow researchers to describe and investigate the constructs that may contribute to a student's beliefs about intelligence and learning (Dweck & Leggett, 1988). Dweck and Leggett (1988) classified these theories based on an individual's beliefs about the malleability of intelligence and other attributes. Incremental theorists believe that intelligence is malleable and have the growth mindset. Students with this mindset believe that through effort, effective strategies, and high-quality feedback, intelligence and learning can improve and challenges can be overcome (Dweck, 2006). Students with a growth mindset demonstrate positive academic emotions, including a sense of belonging, curiosity, and interest (Rattan et al., 2015; Shih, 2011), resulting in increased engagement and motivation (Bourgeois & Boberg, 2016). This helps students successfully maintain academic achievement throughout the

transition to middle school, perceiving the change in the learning environment as an opportunity to grow, try new experiences, and explore options for the future (Dweck, 2006).

Growth mindset influences many of the attributes of a successful learner. It has been linked to the development of mastery goals versus performance goals. Meece (2003) defined mastery goal orientation as a desire to focus on learning in content and skill development to improve oneself. Research has shown that a growth mindset allows a student to focus on learning rather than working toward maintaining a certain status within their peer group (Dinger & Dickhauser, 2013; Hayenga & Corpus, 2010). Growth mindset influences many of the attributes of a successful learner. The focus on process and learning increases a student's willingness to struggle through challenges and persist (Dweck, 2006).

Entity theorists, on the other hand, hold the belief that intelligence and other attributes are not malleable (Dweck, 2006). According to Dweck (2006), entity theorists see intelligence as a pre-determined entity that cannot be improved through effort. Students with this outlook are said to have a fixed mindset, and they are more likely to experience negative academic emotions such as stress and anxiety (Rattan et al., 2015; Shih, 2011). Students with a performance goal orientation even demonstrate a decrease in engagement and motivation (Bourgeois & Boberg, 2016). The result is students who focus on praise versus process, as they are looking to maintain status rather than explore learning opportunities (Dweck, 2006). Performance goals refers to a student's tendency to focus on demonstrating their ability and how it compares to others in the hierarchy of peer abilities (Meece, 2003). Dinger and Dickhauser (2013) explained that students with a fixed mindset focus on ability feedback and, as a result, are more likely to develop performance goals than mastery goals. Dweck (2006) highlighted the impact of performance goals for adolescents, stating that they tend to mobilize their resources and efforts not for

learning but to protect their ego. The result is a decrease in motivation and engagement (Dinger & Dickhauser, 2013) and a low effort syndrome wherein students' efforts are mobilized to protect their ego rather than to extend learning (Dweck, 2006). Students who do not believe that effort can improve outcomes hesitate from facing a challenge, afraid that a struggle will lead to failure (Dweck, 2006). Research has shown that mindset impacts both cognitions and emotions, which play an essential role in student learning and their experiences in school settings. These mindsets have the potential to increase the stage–environment fit in middle schools.

Links between Mindset and Student Internal Factors

Mindset and intrinsic motivation. Researchers have demonstrated the potential effects of the growth mindset on many of the internal factors that impact the self-concept of students and their development as learners (Booth & Gerard, 2014). Dweck (2006) explained the cultivation of a student's growth mindset in a nurturing learning community; high expectations and scaffolded support led to the development of positive beliefs about learning and the power of struggle. This was supported by Haimovitz et al. (2011), who conducted a study on 938 eighth-grade students, examining their beliefs on intelligence along with ability–validation goals and intrinsic motivations. They found that a fixed mindset predicted a decline in intrinsic motivation and ability–validation goals (Haimovitz et al., 2011). Both these factors contribute to the academic decline typically seen during a student's transition from elementary to middle school, which highlights the link between mindset and the stage–environment fit (Eccles et al., 1991).

Mindset and academic emotions. Several researchers have examined the academic emotions students bring to school and the impact of mindset on those emotions (King, 2012). For instance, King (2012) examined the link between growth mindset and emotional well-being in school in relation with self-esteem and relationship harmony. The results indicated that the fixed

mindset was a negative predictor of achievement and self-esteem and a positive predictor of academic emotions. In other words, students who believe that intelligence is malleable experience more positive emotions and relationships and higher self-esteem.

The literature also a study by Shih (2011), who outlined the outcomes of positive relationships and academic emotions seen in students with a growth mindset. Shih (2011) examined the relationship between mindset and academic emotions, behavioral self-regulation, self-handicapping, and self-worth. The researcher surveyed 300 middle school students in Taiwan and determined that students with the growth mindset showed an increase in academic emotions and greater self-regulation, and they were more likely to persist when engaged in challenging academic tasks.

Mindset and self-efficacy. Self-efficacy refers to the belief that one can complete a task or fulfil a challenge (Bandura, 2001). Davis, Burnette, Allison, and Stone (2011) explained that this internal belief, in the face of a challenge, is a predictor of academic achievement. To extend the understanding of mindset and self-efficacy, Davis et al. examined the interaction between the theory of intelligence, an underdog or top dog status, and feelings of self-efficacy or helplessness. To extend the understanding of mindset and self-efficacy, Davis et al. used an experimental design that would induce feelings of superiority or inferiority in participants. In this study, participants were manipulated by the experimental design into experiencing the top dog or underdog status before an upcoming challenge through the proposed opponent in a math competition. The survey results showed that students with the fixed mindset were more likely to experience feelings of helplessness. In contrast, those with the growth mindset reported a greater sense of self-efficacy, and even when made to feel like they were up against unbeatable odds, they were more likely to persist due to their self-efficacy.

Mindset and stereotype threat. Historical and predictive, achievement gaps based on race and gender are partially a result of the negative labels students' experience, leading to stereotype threat (Dweck, 2006). Negative labels are implicit cultural and external messages that many students experience as a result of their race, gender, or socioeconomic level (Dweck, 2006). These labels, when evoked, increase the stress and anxiety of students, taking their energy and focus away from challenges and impede success. Students with the fixed mindset will be negatively affected by these labels, whereas students with the growth mindset will be able to view them as external factors and someone else's view and then be able to take on the challenge.

The impact of the growth mindset on stereotype threat was investigated by Rattan et al. (2015). The authors reviewed the current mindset research that describes how mindsets can be used to increase academic achievement and narrow historic achievement gaps (Rattan et al., 2015). The analysis outlined how a student's mindset predicts achievement as much as a factor such as poverty (Rattan et al., 2015). The conclusion supported the work of Dweck (2006), showing that the growth mindset was especially helpful for minorities and female students as it helped counteract stereotype threat (Rattan et al., 2015). An additional finding was that mindset interventions could increase a sense of belonging in students, helping them build positive relationships and self-concept. This sense of belonging and explicit messaging, which goes against stereotypes, leads to a better fit between the individual's needs and the factors in the school environment, therefore, leading to increased achievement.

Internal factors such as intrinsic motivation (DeCastella & Byrne, 2014), self-efficacy (Frieldel, Cortina, Turner, & Midgley, 2010), internalized stereotype threat, and a sense of belonging (Schmidt et al., 2017) impact student learning and achievement. Growth mindset has been shown to address internal factors that increase a student's self-concept and self-efficacy and

help them overcome the impact of external micro-aggressions and stereotypes (Rattan et al., 2015; Davis et al., 2011). The research included here highlights the power of the mindset to meet students' developmental learning needs as they transition from elementary school to middle school.

Links between Mindset and Student External Factors

Mindset and academic achievement. Growth mindset has also been proven to moderate the effects of external factors by Claro et al. (2016). Claro et al. (2016) surveyed all 10th graders in Chile, examining the impact of growth mindset on academic achievement through the lens of poverty. The extensive survey size allowed them to effectively examine the relationship between mindset and achievement at all socioeconomic levels. The results indicated that growth mindset was an accurate predictor of achievement; students with the growth mindset at all socioeconomic levels scored higher than those with the fixed mindset.

While predictable trajectories of achievement were seen across the spectrum of socioeconomic levels, the data showed that students in the lowest socioeconomic group with the growth mindset outperformed even those in the highest socioeconomic group with the fixed mindset (Claro et al., 2016). Although the results were promising, they indicated that students at lower socioeconomic levels were more likely to have the fixed mindset and, as a result, lower achievement levels. The study suggested that if students from a low socioeconomic level were made aware of the incremental theory of intelligence, it could improve their scores, while certainly not addressing all the obstacles experienced by students living in poverty.

Growth mindset allows students to transition to middle school with the understanding that there will be challenges but they will be able to overcome these (Romero, Master, Paunesku, Dweck, & Gross, 2014). In 2014, Romero et al. (2014) examined the impact of growth or fixed

mindset regarding intelligence and emotions as a moderating factor on academic achievement and willingness to take on academic challenges using upper-level math courses. In this longitudinal study, researchers surveyed students four times between Grade 6 and Grade 8 in addition to monitoring their grades and the courses they selected. The results demonstrated that a malleable view of intelligence translated into an increase in the grade point average and the difficulty level of the courses the students selected. The predictive nature of the growth mindset on grades and the willingness to embrace challenges through course selection suggest the power of mindset in determining the trajectory of early adolescents' academic achievement.

Romero et al. (2014) highlighted the tendency for students with the growth mindset to accept challenges when selecting courses. Greater rigor in coursework comes with a greater challenge. Aditomo (2015) examined the impact of the growth mindset of intelligence and academic ability on students' resilience, ability to overcome a setback, and their ability to attribute effort to eventual success. Aditomo (2015) surveyed 169 students enrolled in a behavioral statistics course. The students were surveyed at the beginning of the semester and after the midterm to measure their theories of intelligence, academic ability, learning goals, effort attributes, and demotivation. Researchers were attempting to determine how students responded after poor results on their mid-term exam. The results indicated that the growth mindset relating to academic ability showed a positive correlation with learning goals and effort attribution and negatively predicted demotivation. The findings in this study support the theory that if a student believes academic ability to be malleable, they will be willing to persist and see effort as a method to overcome obstacles.

Mindset and student relations. Student relationships play an integral role in the development of student self-concept, positive academic emotions, and the ability to seek

guidance and grow from the feedback. Growth mindset focuses on effort, effective strategies, and feedback from others. Therefore, the nature of relationships in a learning situation is vital for student success (Briceno, 2015). The synergy of these three characteristics in mindset highlights the importance of relationships and coaching students through experience, as it pertains to learning. Dweck (2006) highlights the importance of educators, coaches, and parents in creating a space for students to celebrate effort and learn the importance of preparation and effective feedback. Fundamental relationships are further described in the research of Gniewosz et al. (2012), who studied the development of academic self-concept during the transition from primary to secondary school. As students transition to a new setting and a new academic environment, they have little reference for the predictive power of grades and, as a result, are unable to accurately measure their current level of learning or academic success. At the beginning of the transition, students rely on the beliefs and feedback of the adults in their lives to develop the self-concept of themselves as learners. Only after they have experience with higher standards, ability grouping, and strict grading practices can they use academic feedback to measure their progress.

In addition to making sense of a new environment, adult relationships impact the academic emotions experienced by students (King et al., 2012). They examined the relationships that play a significant role in student transition by looking at the implicit theories of intelligence and academic emotions. The researchers surveyed secondary school students in the Philippines on parental support, teacher support, their theory of intelligence, academic emotions, and achievement goals. They found that the fixed mindset resulted in negative academic emotions, such as low task value and a low degree of perceived student control over the task. The study

found that the fixed mindset is detrimental to the emotional experience of a student in school and suggested that the support of teachers and parents can help increase positive emotions.

The support provided by teachers and parents is often through their feedback and guidance as students work to master concepts and persevere through academic struggles (Barnes & Fives, 2016). Barnes and Fives (2016) took a closer look at the link between student-centered feedback and assessment and developing a culture of growth mindset. The researchers used observations and interviews to determine the characteristics of assessment that create a classroom culture of growth mindset. The study highlighted the importance of encouraging students to take academic risks and see mistakes as opportunities to learn in addition to high expectations, emphasis on effort, and timely, formative, and process-oriented feedback. The researchers found that explicit focus of instructional practices and discourse about the process over a product created a healthy and supportive environment for early adolescents (Barnes & Fives, 2016).

The studies outlined in this section of the literature review highlight how structures and relationships in middle school can support students as they enter a new school environment. The support, explicit feedback, and development of the growth mindset can help strengthen the stage–environment fit, which is discussed in the next section, effectively meeting the needs of students and improving educational outcomes for them (Barnes & Fives, 2016; King et al., 2012; Rattan et al., 2012).

Links between Mindset and School Environment Fit

Eccles et al. (1991) described the decrease in motivation, engagement, and achievement in early adolescents through the lens of the stage–environment fit theory, which described the aspects of the learning environment that do not meet the unique needs of early adolescents. The

same outcomes have been shown to be improved or moderated with a view of intelligence and other attributes as malleable. The idea that intelligence and other characteristics are malleable has been described as the growth mindset (Dweck & Leggett, 1998).

The school climate has been shown to play a significant role in the link between the overall school environment and a learning community's ability to meet the developmental needs of students (Ellerbrock & Kiefer, 2013). Booth and Gerard (2014), through a mixed methods design, studied the impact of the school climate on a student's attitudes and perceptions of school. In this longitudinal study, the researchers surveyed 518 middle school students and 526 high school students on self-appraisal, school attitudes, school climate, and connectedness. The results highlighted the importance of the school environment on the high levels of self-esteem and self-efficacy (Booth & Gerard, 2014). The results demonstrated that as students progress through middle school, the changes in the school climate, a lack of support, and changing student–teacher relationships led to a decline in the school attitude in students (Booth & Gerard, 2014). This decline indicates a lack of fit between the developmental stage and the school environment.

Aiming to determine which variable had the greatest influence on student engagement, Symonds and Hargreaves (2016) studied the contributing factors that impact the stage–environment fit. The researchers took into account gender, puberty, and school perceptions to create groups that represented the strata of a school environment. The study included students from Grade 6 through Grade 8 in one setting that included a transition to middle school and another that kept students in a K–8 setting. The researchers found that student relationships with teachers and peers were the most significant stage-environment interactions.

Developing Growth Mindset: Intervention Research and Results

Intervention research and results. Since the introduction of the growth mindset and its potential implications for learning, a series of studies have examined how this mindset can be developed in individuals. The literature reviewed here highlights the effects of interventions of varying lengths, from a single session (Schleider & Weisz, 2018; DeBacker et al., 2018) to two class periods (Yeager et al., 2016; Paunesku et al., 2015), a single week (Yeager & Dweck, 2012; Burke & Williams, 2012) and longer 6- and 8-week interventions (Schmidt et al., 2017; Blackwell et al., 2007) on academic achievement and the classroom environment.

Blackwell et al. (2007) examined the effect of mindset interventions on learning and academic achievement. This study on seventh-grade students demonstrated the positive impact of growth mindset intervention on student motivation and academic success. The decline in grades, typically seen in middle school, was reversed in the experimental group.

The research that followed the Blackwell et al. (2007) study examined if similar results could be found with shorter interventions and if they could be taken to scale in implementation. DeBacker et al. (2018) explored the impact of single session intervention on mindset and academic goals. The research included 261 ninth and 10th graders from two high schools who participated in a 55-minute intervention at the ninth-grade level. Then, all the students completed a survey on mindset and achievement goals. The results demonstrated a direct correlation between implicit beliefs and mastery goals, which is consistent with the greater body of the literature. A view of intelligence as malleable resulted in the students focusing on learning versus simply verifying their ability.

Paunesku et al. (2015) examined the impact of a large-scale growth mindset and sense of purpose interventions at the high school level. In this study, 1500 students in 13 high schools

across the country were randomly assigned to a control group, a growth mindset intervention, a sense of purpose intervention, or an intervention that included both. They participated in two 45-minute intervention sessions, which led to a significant improvement in the core grades between the control and experimental groups.

Context and growth mindset interventions. Beyond the length of the intervention, research studies have examined the classroom context and culture that leads to the development of the growth mindset. Burke and Williams (2012) examined the impact of a thinking skills intervention on students' beliefs about the malleability of intelligence. Researchers divided 178 students into three groups: a control group, a collaborative learning intervention, and an individual intervention. The intervention groups were provided with explicit instructions on thinking skills embedded in several content areas. A significant difference was found in means between the three groups. All the students in the intervention group showed a significant increase in scores, with the collaborative group demonstrating the largest increase. The interactions and feedback from peers helped the students internalize concepts.

After collaboration was shown to increase the impact of an intervention, Schmidt et al. (2015) looked at the mindset of the teacher and how their interactions with students might influence mindset interventions. After a 6-week intervention, the researchers discovered that the results of the intervention depended on the classroom teacher. Teachers with the growth mindset infused practices, reteaching, and references into their daily work, which helped students internalize an incremental view of intelligence.

Understanding the significance of the educator and the power of collaboration, the review of literature considers the impact of the growth mindset on the experience of the student in the classroom environment. Schmidt et al. (2017) examined the impact of a 6-week classroom

intervention on growth mindset and the quality of students' everyday classroom experience. The researchers found that a decline in interest may be counteracted through mindset interventions. These results can be, in part, attributed to the greater sense of control and self-advocacy experienced by the ninth graders as a result of the intervention. This study extended current mindset research by including a measure of student experience in the classroom, as it is relevant for mindset and a student's perceived ability to change.

Yeager and Dweck (2012) examined how an incremental view of mindset impacted the students' view of the malleability of academic and socio-emotional characteristics. The researchers found that short, concise, and age-appropriate interventions can help build the growth mindset and resilience in students of all ages. The positive impacts of the intervention that the researchers documented included an increase in students embracing and working through challenges, academic achievement, and resilience in the face of social isolation. The targeted intervention, along with the user-centered intervention used in the Yeager et al. study, provided evidence that the view of intelligence and other characteristics as malleable helps in counteracting the decline seen in middle school students and helps them meet many of the challenges of the school environment.

Collectively, the research shows that interventions of various lengths can develop the growth mindset in students. The interventions are strengthened when they are targeted toward the culture of the learning environment and supported through interactions with peers and teachers.

Moderating Effects of Feedback from Parents and Teachers

Throughout the literature, researchers have highlighted the integral role of parents and teachers in the development of a student's self-concept (Symonds & Hargreaves, 2016; Dweck 2006; Haimovitz & Dweck, 2017). During the transition from elementary to middle school,

much of the learning environment and practices are new to students. As a result, they struggle to interpret the feedback and build a healthy self-concept (Gniewosz et al., 2014). Symonds and Hargreaves (2016) demonstrated the importance of parental beliefs about student competency and the messages they convey to their children. This emotional support and feedback validates and guides students through the changing setting, helping them navigate the transition until they can better understand the grading practices and higher standards and use assessment results to measure their learning outcomes.

Beyond the initial transition, the beliefs and behaviors of teachers and parents have been shown to play a significant role in the mindset development and view of failure of students (Gniewosz et al., 2012; Gniewosz et al., 2014; Haimovitz & Dweck, 2016). In 2014, Gniewosz et al. investigated the links between grades, parental perception of ability, self-concept, and intrinsic motivation. Surveys on students in the United States and Germany measured students' self-concept, motivation, and perception of competence. While both students and adults were found to use grade information in their competency beliefs, the researchers investigated the feedback of parents that influences the development of a student's self-concept. It was noted that a stronger self-concept led to an increase in intrinsic motivation. The research highlighted the importance of feedback and suggested that it could be used to amplify or counteract negative feedback in another realm of the child's learning experiences. Dweck and Yeager (2019) highlighted the need for research on the cues from the classroom environment that students might use to construct mindsets.

Friedel et al. (2010) examined student self-efficacy through school transition based on perceived feedback from teachers and parents. A student's perception of a teacher's mastery goal was positively related to their self-efficacy. The teacher's impact on mastery goal development

and focus on learning and the growth mindset was seen in the work of Schmidt et al. (2015). In this study, the researchers examined the effectiveness of an intervention through the lens of the teacher in the classroom. They found that students' long-term gains from the six-week intervention were directly related to those of the teacher and reflected the mindset of the teacher in the classroom. Teachers with the growth mindset infused instructional practices, feedback, and reteaching opportunities, along with modeling their daily work, which helped students internalize the growth mindset themselves.

During the transition from elementary to middle school, students depend on feedback from adults to help them interpret and navigate the new learning environment (Schmidt et al. 2015; 2017). This feedback influences the development of self-concept and self-efficacy (Friedel et al., 2010). Much of this feedback comes in the form of perceived competence perceptions and the goal orientation of their parents, and it is essential for teachers to confirm that feedback in all its forms (Haimovitz & Dweck, 2016; Rattan et al., 2012).

Views of Intelligence and Failure

Parents' views of intelligence and failure. Throughout the learning process, students face challenges and experience failure (Oyserman et al., 2018). The messages of adults influence how students respond to these challenges and failures. Previous research has examined the moderating influence of a parent on growth mindset (Haimovitz & Dweck, 2017; Gniewosz et al., 2014). Haimovitz and Dweck (2016) explored the impact of the failure mindset and, more specifically, the failure-is-enhancing or failure-is-debilitating mindset. They set out to determine if students were able to perceive their parent's failure mindset and how it impacted their own view of the malleability of intelligence. A collection of four studies found a significant negative

correlation between the failure mindset of the parent and the intelligence mindset of the child as a parent's failure-is-debilitating mindset led to the development of fixed mindset in the child.

A parent's failure mindset impacts their reaction to their child's struggle. Hence, a failure-is-debilitating mindset leads to a focus on performance goals over learning, and this reaction to struggle allows children to accurately predict their parents' failure mindset, while they were unable to do the same with their intelligence mindset. The feedback children receive impacts their self-concept and view of intelligence; it is easier for them to interpret failure mindsets and feedback, which could inadvertently impede learning and motivation. The transition from elementary to middle school is filled with changes and challenges. In such a situation, parents can play an integral role in creating a supportive environment that increases the fit between the environment and developmental needs of early adolescents.

Teachers' view of intelligence and failure. Teachers play a formative role in a student's development as a learner through classroom practices and feedback (Rattan et al., 2012). Shim et al. (2013) examined how teachers' beliefs about intelligence and goal development impact their instructional practices. They surveyed 209 primary and secondary teachers on classroom goal structures, achievement goals, and their theories of intelligence. The data did not support the idea that achievement goals and the implicit theories of intelligence would impact classroom goals structure. The data did, however, support the idea that there was an "interactive" impact of achievement goals and the implicit theory of intelligence on classroom goals structure. Teachers with performance-approval goals were more likely to have classrooms that promoted competition. Since competition is one of the characteristics of the secondary learning environment that does not meet the developmental needs of adolescents, this research suggests

that the educator mindset could play a role, positive or negative, in the improving the stage–environment fit.

The stage–environment fit theory suggests that the differences in assessment practices is one of the ecological factors that led to a lack of fit and the decline of student engagement (Eccles et al., 1991). Barnes and Fives (2016) used the observations and interviews of a selected teacher who met the quality and expertise standards to determine the characteristics of assessment that created a classroom culture or context for growth mindset and growth-mindset-focused assessment. They found that an explicit focus on learning strategies and discourse about process over product helped create a healthy and supportive learning environment. Such a formative environment includes characteristics such as student-centered feedback, modeling that mistakes are okay, process-based feedback, measurement and celebration of growth, and high expectations for all students.

These findings are supported by the work of Britner and Pajares (2006), who explained that scaffolding and modeling of work in class can increase student self-efficacy through vicarious experiences and social persuasion. The need for discourse and collaboration in a student-centered growth-mindset-oriented culture was explored in the work of Burke and Williams (2012). Their study investigated interventions that did/did not provide opportunities for students to work through new ideas collaboratively. The results showed a significant difference in means between the groups that experienced the intervention individually and those that did so collaboratively.

In all, teachers have been shown to play an integral role in student development and overall stage–environment fit (Dweck, Walton, & Cohen, 2014). What is yet to be explored in the current research is how the instructional practices used in the classroom, along with the

messages and feedback the teacher provides at times of failure and setbacks, impact a student's mindset and willingness to embrace challenges. This is the area of learning that the present study is proposing to explore.

Review of Methodology

The review of methodology in the literature review highlights the value of the quantitative survey in this study of mindset. Many of the studies outlined in the literature review use a correlational design, which allows researchers to measure the relationship between the mindset and the constructs associated with learning (Creswell, 2014). Foundational studies by Dweck and Leggett (1988) examine the implicit theories of intelligence with the help of surveys to measure a subject's growth or fixed mindset. Self-report surveys have been used throughout the research to understand the contextual nature of mindset and extend that understanding to the constructs of stress mindset (Crum, Salovey, & Achor, 2013), failure mindset (Haimovitz & Dweck, 2016), perfectionism (Shih, 2011), self-concept, and self-efficacy (Friedel et al., 2010)

Surveys. Surveys allow researchers to quantify the constructs associated with mindset, attitudes, and behaviors in an identified population (Creswell, 2014). The studies in this review rely heavily on self-report surveys from individuals from early elementary school through college along with their teachers and parents (Haimovitz & Dweck, 2016; Gniewosz et al., 2014). One of the biggest advantages of surveys is that they allow researchers to collect data from a large population in a short span of time (Claro et al., 2016) so researchers can identify trends in the relationships between constructs better. A second advantage is the number of constructs that can be measured with a single survey instrument. This was seen in studies by Haimovitz and Dweck (2016) and Crum et al. (2013). Researchers were able to examine a number of hypotheses that built on one another to provide a richer understanding of the

relationships between constructs, how they were developed, and the interactions that affected them.

One limitation that has been identified by the research teams of DeCastella and Byrne (2014) and Shim et al. (2013) is the aspect of self-reporting. As Schmidt et al. (2015) pointed out, self-reporting could skew results to the positive, as teachers and students may predict the interests of the researchers and may, as a result, rate elements higher than usual. Another limitation of the survey design is the inability to gather explanations and contextual evidence to understand the reasons for scores on the survey items such as Likert-scale items.

Interventions and manipulations. Several studies used an experimental design to test the effectiveness of an intervention (Blackwell et al., 2007; Schmidt et al., 2015; Paunesku et al., 2015), while others took steps to manipulate a particular mindset before implementing the survey. This was seen in the work of Davis et al. (2011), as they examined the interaction between the theory of intelligence, underdog/top-dog status, helplessness, and self-efficacy. Crum et al. (2013) proposed that stress mindset is a construct that can, like failure mindset, have debilitating or enhancing attributes. Using a reliable stress measurement tool, researchers tested whether mindset changes occur through intervention and if this change of mindset would alter performance. In each of these studies, the researchers were able to divide participants into test and control groups.

Grouping and clustering data. When examining the context behind the mindsets, there are several variables that may contribute to the development of growth or failure-is-enhancing mindsets. Researchers cluster data into classrooms to examine the effect of the teacher's mindset (Schmidt et al., 2015) or dyads, which would show the relationship between the parent and the outcomes measured in the child (Haimovitz & Dweck, 2016). Grouping data allows researchers

to conduct group comparisons through t-tests, analysis of variance, and analysis of covariance as well as examine the relationship between variables through multiple regression (Creswell, 2014).

Population. Early studies focused mostly on Western and White populations in their studies. In recent years, the scope of research has broadened as researchers work attempt to understand how implicit theories of intelligence moderate the impact of poverty (Claro et al., 2016), surveying every tenth grader in Chile in the process. Other studies have set their research sites outside Western settings; King (2012) conducted his study in the Philippines, while Shih (2011) set his study on perfectionism in Taiwan. Yet others have used a multi-cultural approach to determine the impact of culture as a moderating factor in learning (Chen, Chen, Dai, Man, & Cheng, 2018). Chen et al. (2018) examined how students in the United States and Macau responded to self-enhancement and self-criticism. The cultural difference highlighted through data indicated that within the Chinese context, students see losing and self-criticism as motivational factors. Future studies will be more conclusive when more diversity is included to demonstrate the universality of the findings.

The methodology outlined in this literature review highlight the established methods to collect data that will elicit information about individual constructs and allow researchers to examine the relationship between constructs. While some limitations have been identified, the number and importance of studies using these methods provide credibility and reliability for future researchers.

Synthesis and Critique

This literature review was examined through the lens of the conceptual framework, looking at how growth mindset influences systems, instructional practices, interactions, and finally the individual learner to increase the level of fit between the learning environment and the

developmental stage of the learner. Four key themes arose throughout the literature review: (a) impact of mindset on academic emotions and cognitions (King, 2012), (b) impact of mindset on motivation and achievement (Haimovitz et al., 2011; Claro et al., 2016), (c) developing growth mindset through interventions (Paunesku et al., 2015), and (d) impact of parents and teachers on the development of mindset (Rattan et al., 2012; Haimovitz & Dweck, 2016). The themes, when studied collectively, illustrate a means to change the narrative of a student's transition from elementary to middle school, creating a classroom or school that better meets the unique developmental learning needs of early adolescents.

Impact of mindset on self-efficacy and academic emotions. The first theme of the current research focused on the moderating influence of mindset on the documented declines in achievement, motivation, and self-efficacy that occur during students' transition from elementary to middle school (Eccles et al., 1993). Eccles et al. (1991) emphasized the need for a safe and supportive environment that allows students to develop autonomy and positive academic emotions. Academic emotions can be defined as a sense of belonging that allows students to counter the explicit messaging that typically leads to stereotype threat. Rattan et al. (2015), Yeager and Dweck (2012), Paunesku et al. (2014), DeCastella and Byron (2014), and Shih (2011) documented the correlation between mindset and academic emotions. These researchers explained that positive academic emotions, which positively correlate to growth mindset, impact students with adaptive or maladaptive perfectionism (Shih, 2011), anxiety (Schleider & Weisz, 2018), poverty (Claro et al., 2016) as well as gender and race stereotype threats (Rattan et al., 2015). In these cases, viewing intelligence as malleable allows students to see their academic success as a result of their effort so they would not be limited by societal beliefs and bias. However, researchers also noted that fixed mindset was a dependable predictor of negative

school emotions, as reported by parents (Shih, 2011). This was observed in a number of depressive incidents (Paunesku et al., 2014) as well as great amounts of stress (Yeager & Dweck, 2012). Students with the fixed mindset see intelligence and other characteristics as unchangeable entities. Therefore, all challenges are seen as failures, with little scope for improvement. The benefits of positive academic emotions creates a strong and supportive learning environment that increases the fit between the developmental needs of early adolescents.

Growth mindset has also been shown to have a positive effect on student cognition (Dweck, 2006). The view of intelligence as malleable has proven to lead to an increase in resilience (Yeager & Dweck, 2012), self-regulation (Shih, 2011), and self-efficacy (Britner & Parajes, 2006). Yeager and Dweck (2012) defined resilience as any behavioral or emotional response to a challenge that is beneficial and leads to a continued focus on learning. The researchers concluded that the growth mindset helped students see challenges as opportunities to learn and, therefore, allowed them to persist, seek feedback, and attempt new strategies, increasing engagement and resilience (Yeager & Dweck, 2012). In addition to resilience, an increase in positive academic emotions leads to an increase in self-regulation (Shih, 2011) and self-efficacy (Britner & Parajes, 2006). Schmidt et al. (2017) described the overall impact of mindset and positive academic emotions on students' classroom experiences. Growth mindset intervention was seen to increase the students' feeling of control and self-advocacy, which resulted in an increase in the daily school experience of students. The positive impact of growth mindset on cognition leads to the development of strong self-concept and self-efficacy. Students become ready to take on challenges and persevere through struggles to expand their learning.

The complete body of research in the literature review suggests that the view of the malleability of intelligence can counter the traditional struggles middle school students

experience. The results indicate that the growth mindset has positive impacts on academic emotions and cognitions. Studies have found that a student's belief in the malleability of characteristics allows them to focus on their own learning and growth (Schmidt et al., 2017; Britner & Parajes, 2006). Yeager and Dweck (2012) noted that a student's mindset allows them to take advantage of a new learning environment with a greater sense of belonging in a supportive learning environment. Multiple studies support the idea that an increase in self-concept, self-efficacy, and resilience can be observed in students with the growth mindset. These studies explained that the growth mindset allows students to examine a situation, view different outcomes, and identify strategies for success. A combination of emotions and cognitions supports student learners in their academic endeavors.

Impact of mindset on motivation and achievement. The literature includes studies that highlight the impact of the growth mindset on achievement and intrinsic motivation (Claro et al., 2016; DeCastella & Byron, 2014). Rattan et al. (2015), Paunesku et al. (2014), and DeCastella and Byron found a positive correlation between growth mindset and academic achievement as measured by course grades and the overall grade point average. This summative measure of academic success is a combination of other academic attributes such as motivation, self-concept, self-esteem, and an appreciation for challenges, which are influenced by growth mindset. Studies by DeCastella and Byrne (2014), Aditomo (2015), and Dinger and Dickhauser (2013) highlighted the role of growth mindset as a predictor for the development of mastery goals.

DeCastella and Byrne surveyed 680 high school students and found that growth mindset correlated to an increase in mastery goals and intrinsic motivation, while fixed mindset correlated to performance goals, helplessness, and work avoidance. While examining the buffering effect of growth mindset on demotivation, Aditomo demonstrated that growth mindset

correlated with learning goals and effort. Students with this mindset are focused on extending learning rather than proving their ability to peers, along with an increased level of engagement and effort to achieve those learning goals while studying the moderating effects of self-enhancement and self-criticism. Chen et al. (2018) identified the positive correlation between mindset and motivation, both in success and failure. Those with growth mindset saw failure as an opportunity to learn new skills and grow as learners (Chen et al., 2018). This finding is supported by the work of DeCastella and Byrne—as well as Aditomo (2015)—both studies linked an increase in motivation to increase in effort and decrease in self-handicapping and disengagement. Haimovitz et al. (2011) surveyed 938 eighth graders in the Fall and Spring to classify participants as "decliners" or "maintainers." The results demonstrated that fixed mindset was a predictor of decliners in the study.

Overall, research shows a link between growth mindset and mastery goals, which impacts student's approach to learning, willingness to embrace a challenge, and persist through struggle. Similar to the research examining academic emotions, some studies also highlighted the powerful impact of fixed mindset. DeCastella and Byrne found that fixed mindset was negatively associated with mastery goals and work avoidance, which led to lower achievement and an increase in self-handicapping and disengagement.

In summary, growth mindset has been shown to have a positive impact on motivation and academic achievement. Multiple studies have discussed the link between growth mindset and higher achievement, as measured by grades and the extent to which a student takes on challenges. This increased achievement is explained, in part, by the development of mastery goals rather than performance goals, which emphasizes the focus on learning as opposed to proving one's ability. Mastery goals were linked to motivation as they allow students to maintain

motivation during the transition from elementary to middle school. While the research in the literature highlights the positive impact of growth mindset, it also demonstrates the detrimental impact of fixed mindset. These results point to the significant role mindset and the view of the malleability of intelligence on early adolescents and the importance of creating a middle school that best fits the developmental needs of adolescent students.

Developing a growth mindset through interventions. The focus of several studied in the literature review was understanding the potential of mindset as a moderating factor in students' experience during the transition from elementary to middle school and improving the stage–environment fit. These studies examined how interventions can be used to develop growth mindset. Blackwell et al. (2007) illustrated that mindsets can be manipulated in individuals, which leads to positive impacts on learning and achievement. Students with growth mindset hold more positive beliefs about effort and the importance of effective strategies in the face of failure. In this experimental study, the intervention was effective in teaching growth mindset and altering the students' approach to learning. These findings have been supported with studies that replicated the positive impacts of interventions despite the number of sessions included in a particular intervention (Schleider & Weisz, 2018; Yeager et al., 2018). Overall, the literature illustrates that any amount of exposure to the concept of the malleability of intelligence impacts student's approach to learning and their view of themselves as learner, since students then see that they can learn and grow with extended effort.

Taking into consideration that mindset can be cultivated, the literature review focuses on the context that best facilitates that development (Yeager et al., 2016). The research discussed illustrates the powerful nature of interventions that were adapted to the culture and context of a student's experience and the developmental needs of early adolescents (Burke & Williams,

2012). Yeager et al. (2016) started with the original Blackwell et al. (2007)'s intervention tool and then used age, community, and cultural feedback to create a new user-centric intervention tool. The intervention had a greater impact as it was adapted to the culture and context of the learning environment. Yeager et al. (2016) also noted that change did not come quickly. Students needed to see the effects of their mindset to continue developing and internalizing a view about the malleability of intelligence. Burke and Williams examined the impact of an intervention that explicitly taught thinking skills in collaboration with the growth mindset. The results showed that students were more likely to identify with the malleability of intelligence post-intervention and to use thinking skills and strategies to create their own definition of intelligence. Researchers highlight the need for further examination of the methods teachers implement to make these connections explicit for young learners. The body of research points to the power of incorporating development- and age-appropriate instructional strategies that allow students to explore and develop the growth mindset.

The literature suggests that the context of learning matters as well. Paunesku et al. (2015) conducted a survey on 1500 students divided into a control group, a growth mindset intervention, a sense of purpose intervention, or a combined intervention. Researchers found an increase in the core grades of each individual experimental group but not in the scores of those in the combined intervention group (Paunesku et al., 2015). Students were unable to see the connection between the two concepts.

Burke and Williams (2012) and Barnes and Fives (2016) used explicit instruction on thinking skills and a focus on practices and discourse centered on process over product, which led to a significant increase in the effectiveness of interventions. Barnes and Fives (2016) used observations and interviews to study the instructional practices of one teacher to determine the

characteristics of assessment that created a classroom culture and context for growth mindset. The authors documented four key strategies: (a) modeling that mistakes are okay, (b) incorporation of process-based feedback, (c) celebration of growth, and (d) having high expectations for all students.

Studies on growth mindset interventions allow us to envision how interactions and instructional practices can lead to a stronger mindset and a more supportive learning environment for early adolescents (Dweck et al., 2014). The evidence that an intervention of any duration can play a significant role in changing the mindset gives schools an opportunity to build systems of support for students as they transition to middle school (Yeager & Dweck, 2012).

Looking at the unique context of school and classrooms, the studies in this literature review highlight the power of the established culture of learning. Educators, through their instructional practices and interactions with students, play a significant role in developing a mindset for learning and a culture that focuses on learning, even during the struggle (Rattan et al., 2012). The combination of the two contributes to creating a supportive learning environment that allow students to transition to a new level of education with support appropriate to their development and age.

Impact of parents and teachers in the development of mindset. Throughout the intervention literature, it was clear that collaboration and feedback are integral in developing a growth mindset (Schmidt et al., 2015; Barnes & Fives, 2016). The literature review also highlighted the powerful outcomes of student interactions with teachers and parents. Shim et al. (2013) and Friedel et al. (2010) illustrated the power of perceived parent and teacher goal emphasis. More specifically, Freidel et al. (2010) observed a decline in self-efficacy in students in classrooms with a low emphasis on mastery goals. If students interacted with adults who had

developed mastery goals, there was a positive correlation with self-efficacy. Haimovitz and Dweck (2017), on the other hand, found that an adult's mindset did not directly cultivate growth mindset in children and, instead, the response to struggle and failure played an integral role in mindset development (Haimovitz & Dweck, 2016). These findings were supported by the work of Destin and Svoboda (2017), wherein parents' responses to struggles were found to have a greater impact on learning than any other conversations they had with their children. Although children were not able to accurately perceive their parents' view of intelligence, they perceive their failure mindset, which then contributed to the type of mindset they developed (Haimovtiz & Dweck, 2016).

Haimovitz and Dweck (2016) distinguished between two types of mindsets—failure-is-enhancing and failure-is-debilitating mindsets. The significance of the role of the teacher was highlighted by Schmidt et al., who explained that the effectiveness of mindset interventions could be largely attributed to the teacher's mindset. Instructional practices and classroom discourse modeled the mindset and attitudes of failure of students, which impacted the effectiveness of interventions. The research highlights the power of the adults working with children and the explicit and implicit messages they send that guide the development of children's mindset.

Feedback and a modeled focus on process over product build a culture of growth mindset (Barnes & Fives, 2016). The research highlighted the power of feedback on a student's self-concept and view of intelligence (Haimovitz & Dweck, 2016). Researchers found that infusing strategies and reteaching concepts to help students internalize growth mindset (Schmidt et al., 2015) as well as and modeling working through struggles (Barnes & Fives, 2016) can amplify or counteract negative feedback from other sources (Gniewosz et al., 2014). The understanding that

growth mindset can play a moderating role in bridging the gap between developmental needs and ecological factors in middle school helps increase the stage–environment fit.

Studies in the literature review highlight the significant role teachers and parents play in a child's development as a learner (Haimovitz & Dweck, 2016). These messages help students navigate the transition from elementary to middle school (Barnes & Fives, 2016) and influence the mindset students develop with regard to learning. While children are often not able to interpret an adult's implicit view of intelligence, they can accurately predict how these adults respond to failure. This is important when considering the limiting effect of a fixed mindset on academic emotions, cognitions, and achievement. Haimovitz and Dweck illustrated the impact of failure-is-enhancing or failure-is-debilitating mindset and the interactions that contributed to these mindsets. However, what is lacking in the literature is an examination of the interactions between students and teachers that impact the failure mindset. A better understanding of the messages provided through discourse and classroom feedback may be insightful in how a learning community works to develop engaged and adaptable learners.

In summary, messages and feedback from adults play a significant role in the development of the student mindset. Interactions with teachers and parents impact the self-concept and self-efficacy, as they shape their view on the malleability of intelligence. The literature review illustrates that feedback helps students see the benefits of a growth mindset when the focus is on the process over the product. A significant aspect of the research is the finding that feedback relates to failure. This dissertation will examine the impact of teacher feedback as it applies to failure, the development of failure-is-enhancing or failure-is-debilitating mindsets, and coaching students through struggle.

Critique of the Literature

A holistic view of educational attributes illustrates the power of mindset, positive impact of growth mindset, and the detrimental effects of fixed mindset (King, 2012; Davis et al., 2011). The research in the literature identified the benefits of growth mindset but also pointed to the academic handicapping resulting from students' belief that intelligence is not malleable. Fixed mindset has been found to be a negative predictor of achievement and self-esteem (King, 2012) and a positive predictor for maladaptive emotions such as stress and anxiety (Davis et al., 2011). The critique will look at studies that examine the interventions, instructional practices, and feedback that counteract the effects of fixed mindset while developing a malleable view of intelligence. A closer look at the feedback students receive from their parents reveals the power of messages. The critique will examine the literature from that angle to better understand the role teachers play in helping students take on challenges and work through failure.

Holistic view of attributes. Early literature and research on growth mindset is focused on the link between a view of intelligence as malleable and an increase in academic achievement (Dweck, 2006; Blackwell et al., 2007; Romero et al., 2014). These results have not always been replicated in subsequent studies. Aditomo (2015) noted that although data supported a positive correlation between growth mindset and learning goals, motivation and effort did not always translate to an increase in overall achievement.

Current research has focused on growth mindset, but fixed mindset has also been shown to have significant effects on young learners (Haimovitz & Dweck, 2016). While growth mindset does not always have a direct correlation to higher grades and achievement (Aditomo, 2015) or academic emotions (King et al., 2012), the negative impact of a fixed mindset has been established in the literature. Fixed mindset or the entity view of intelligence has been linked to a

decline in motivation (Haimovitz et al., 2011), low achievement and self-esteem, increase in negative academic emotions (King, 2012), and a sense of helplessness (Davis et al., 2011). In 2012, King surveyed 676 Filipino students to measure their view of intelligence, self-esteem, and relationship harmony. Results showed that fixed mindset was a negative predictor of achievement and self-esteem, a positive predictor of negative emotions such as stress and anxiety, and a threat to the ego (King, 2012). While examining the effects of growth mindset on underdog and top dog statuses, Davis et al. (2011) found that students with fixed mindset in an underdog position experience a greater level of helplessness, which leads to a decrease in self-efficacy. Throughout the research, there are examples of fixed mindset negatively impacting students and their continued focus on learning.

The examination of the construct of growth mindset through the lens of the stage–environment fit theory must consider a more holistic view of student engagement and achievement as students move from elementary to middle school. The buffering effects of growth mindset on aspects of early adolescent development, which result from a lack of stage–environment fit, illustrate the need for a broader definition of success (Oyserman et al., 2018). There is a need for research to explore how growth mindset, or the lack of fixed mindset, can alleviate the decline in motivation, engagement, and achievement typically seen as students transition from elementary to middle school.

Focus on feedback and the classroom. Many studies in the literature review examine the impact of interventions on developing student mindsets and helping them cope with the obstacles experienced in school (Blackwell et al., 2007; Yeager et al., 2016; Schmidt et al., 2017; DeBacker et al., 2018; Paunesku et al., 2015). Researchers have also examined the context and feedback that support a change of mindset (Gniewosz et al., 2014; Barnes & Fives, 2016; Rattan

et al., 2012). Although an adult's mindset does not directly influence that of a child (Haimovitz & Dweck, 2017), Schmidt et al. (2015) found that the classroom teacher's mindset has a large impact on the effectiveness of an intervention. Students interpret the teacher's mindset with regard to intelligence and failure through classroom discourse, instructional practices, and feedback. Teachers with a true growth mindset conveyed this through infused classroom practices that focused on learning, reteaching skills as needed, and referencing their own struggles in their everyday lessons. Teachers with fixed mindset create a classroom that is competitive and is focused on ability-based feedback, thus, perpetuating the classroom attributes that are not developmentally appropriate for early adolescents (Schmidt et al., 2015). Research suggests that student's perceptions about learning, challenges, and overcoming failures can be developed within a classroom culture that embraces growth mindset.

The results uncovered through the literature review illustrate the potential impact of the teacher in the classroom as they can be applied to mindset and response to failure. Haimovitz and Dweck (2016) explained that the feedback children received impacts their self-concept and view of intelligence. It is easier for them to interpret failure mindsets and feedback, which inadvertently impedes learning and motivation. While this study is focused on the impact of the parents' mindset and response to failure, there is a gap in the literature when it comes to the instructional practices of teachers and the messages they send to students through their responses to success and failure. Dweck and Yeager (2019) proposed that infusing a classroom environment with the instructional tasks and practices that foster growth mindset may be the most effective kind of intervention. As schools aim to create safe and supportive learning environments for early adolescents, understanding the impact of the teacher is key and requires further study.

This dissertation examined the instructional practices and messages teachers incorporate in their interactions with students that may or may not promote a willingness to embrace challenges and a focus on learning. Focusing on the context of the classroom, the study documents the practices or interactions that impact a student's mindset and keep or do not keep them engaged in their learning. Using setbacks and failures, the study looked for the messages that lead to the development of failure mindset (either failure-is-enhancing or failure-is-debilitating). This failure mindset impacts the way they view struggle, either as an opportunity for learning or as a dead end. The results will allow educators to alter interactions, practices, and culture in the classroom or school to improve the transition from elementary to middle school for early adolescents.

Summary

Research has previously documented the decline in engagement, achievement, and self-efficacy during a student's transition from primary to secondary school (Ellerbrock & Keifer, 2013). This decline in academic trajectory has been attributed to the change of learning environment that focuses on strict grading practices, ability grouping, and changing teacher–student interactions, which has been described in the stage–environment fit theory (Eccles et al., 1993). Student mindset has been shown to positively moderate the ecological factors that limit student achievement (Dweck, 2006). Research has shown that students with growth mindset demonstrate an increase in self-efficacy and intrinsic motivation, which allows students to develop and work toward meeting mastery goals as they then focus on building intelligence (Dinger & Dickhauser, 2013; Dweck, 2006). Students with growth mindset view transitional challenges as an opportunity to grow (Romero et al., 2014). This resilience allows them to

perceive changes in school environments as unique opportunities to learn and build new skills by using new strategies and receiving feedback from others.

Growth mindset has also been shown to improve a student's academic emotions. The increase in positive academic emotions results in a decrease in anxiety (Schleider & Weisz, 2018) and an increase in self-esteem (Eccles, 2004). Students with growth mindset can persist without the documented achievement gaps that typically result from stereotypes and biases based on race and gender (Rattan et al., 2015). In these situations, students are able to view statements as opinions rather than unchanging truths (Dweck, 2006). The view that intelligence is malleable helps students perceive a school environment as safe and supportive.

Research focused on developing a mindset through intervention has demonstrated that a growth mindset can be cultivated. Student mindset studies have shown that context matters as well. Interventions and feedback built into the culture of the learning community allow students to internalize the view of intelligence as malleable. The feedback students receive from adults within that context plays an important role in developing growth mindset and determining how students will view challenges and failures. Haimovitz and Dweck (2016) explained that children are unable to interpret an adult's view of intelligence to determine if they have growth or fixed mindset, but they can interpret reactions and feedback to understand the adult's failure mindset accurately. The parent's response demonstrates either failure-is-enhancing mindset or failure-is debilitating mindset, directly affecting the development of the mindset of the child. The feedback and guidance adults give are vital in helping young learners embrace challenges and focus on learning, even when it includes overcoming obstacles.

This study contributes to the current body of research by extending the understanding of adult feedback during a student's failure. There is a need to focus on the feedback students

receive from their teachers during an academic setback (Haimovitz & Dweck, 2017). Focus on the context of the classroom through an emphasis on instructional practices and the messages students receive will extend the understanding of how to build learning communities that use teachable moments to instill growth mindset and promote a focus on learning. The goal of this research is to explore ways that educators can adjust their instructional practices to better meet the developmental needs of students and increase the stage–environment fit.

Chapter 3: Methodology

Introduction

Early adolescent years are marked with substantial change, including the changes in the learning environment as students transition from elementary to middle school. This educational transition is typically marked with changes in academic beliefs and values (Eccles et al., 1993). The ecological factors of the classroom and school have a significant impact on student engagement and academic success (Quin et al., 2018; Booth & Gerard, 2014), resulting in a decrease in engagement, motivation, and achievement, which can be a predictor for future academic development (Roeser & Eccles, 1998). Due to the significant impact on student achievement, researchers have marked these early adolescent years as a critical point in development (Blackwell et al., 2007) and recognized the importance of noncognitive factors (Pyne et al., 2018).

As outlined in the literature review in Chapter 2, previous research has illustrated the benefits of growth mindset. Dweck (2006) described growth mindset as the understanding of the malleability of intelligence and outlined the benefits of this mindset for learning, specifically overcoming obstacles. More recent research has described the moderating effects of mindset on students' academic emotions and cognitions. An increase in academic emotions allows the student to develop a positive self-concept, which helps create a supportive learning environment (Rattan et al., 2015; Yeager & Dweck, 2012; Paunesku et al., 2014; DeCastella and Byrne, 2014).

Previous research focused on the messages students received from parents and teachers on growth mindset and their view of failure (Schmidt et al., 2015; Haimovitz & Dweck, 2016; Haimovitz & Dweck, 2017). Haimovitz and Dweck (2016) found that students struggle to

interpret their parents' growth mindset, but through their interactions, they can accurately predict their parents' failure mindset. It was easier for them to understand failure mindsets and feedback. This misinterpretation impeded learning and motivation, as the feedback children receive impacts their self-concept and view of intelligence. This study furthers these findings by exploring how the instruction and feedback students receive in the classroom impacts their growth mindset and view of failure.

This mixed methods study contributes to the current literature by furthering our understanding of mindset by examining the link between the context of the classroom and feedback students receive and student mindset and view of failure (Rattan et al., 2012). The areas of growth mindset that this study focused on are students' attitudes toward challenges and the academic culture of a classroom as established through instructional practices and feedback that help students develop the failure-is-enhancing mindset and promote a focus on learning.

The mixed methods research design presented here was examined through the lens of the conceptual framework, the stage–environment fit theory (Eccles et al., 1993). This theory was developed as researchers examined the fit, or lack thereof, of early adolescents and their changing social environment as they transitioned to middle school (Booth & Gerard, 2014). The focus of this study centers on the interactions and instructional practices that impact student mindset. This study examined the impact of mindset as a moderating factor on the new learning environment, allowing students to successfully transition to the social dynamics of middle school.

Chapter 3 outlines the overall mixed methods study developed by this researcher. Chapter 3 includes an introduction of the research questions and hypotheses, research design used in the

study, instrumentation and sample population, data collection and analysis, and the limitations and expected results.

Purpose of Study

The purpose of this mixed methods study was to examine the impact of a student's growth mindset on their attitude toward challenges while exploring the academic culture of the classroom that facilitated mindset development. The stage–environment fit theory (Eccles et al., 1991) highlights the difficulties students experience as they transition from elementary to middle school. The traditional middle school environment is defined by an emphasis on competition, social comparison, ability grouping, and a lack of autonomy (Eccles et al., 1993). Growth mindset has been shown to have a moderating effect on characteristics such as intrinsic motivation (Haimovitz et al., 2011) and academic achievement (Blackwell et al., 2007).

The stage–environment fit theory (Eccles et al., 1991) highlights the importance of the learning environment for early adolescents. According to Eccles et al. (1991), when compared to its counterparts, a school culture that sees intelligence as malleable and has peers and teachers that support and reinforce effort will be more successful in meeting the developmental needs of students, thereby, increasing the stage–environment fit. This mixed methods study examined how instructional practices and feedback facilitate the development of mindset that embraces challenge and sees failure as an enhancing experience. Understanding that the feedback students receive from teachers and parents plays a significant role in the development of mindset, the secondary goal was to identify the instructional practices and messages students receive from teachers that cultivate the failure-is-enhancing mindset in them and enable their ability to work through failure.

Research Questions and Hypotheses

This mixed methods study focuses on the impact of growth mindset on a student's attitudes toward challenges. This researcher is particularly interested in the instructional practices and messages teachers can use to help students develop the failure-is-enhancing mindset in order to keep students' focus on learning and improve the stage–environment fit for them (Eccles et al., 1991) for early adolescents. To this end, the following research questions were included in this study:

Research question 1. Is there a relationship between middle school students' growth mindset and their attitude toward challenges?

$\boldsymbol{H_{O1}}$**.** There is no relationship between middle school students' growth mindset and their attitudes toward challenges.

$\boldsymbol{H_{A1}}$**.** There is a positive relationship between middle school students' growth mindset and their attitudes toward challenges.

Research question 2. Is there a relationship between middle school students' failure mindset and their attitudes toward challenges?

$\boldsymbol{H_{O2}}$**.** There is no relationship between middle school students' failure mindset and their attitudes toward challenges.

$\boldsymbol{H_{A2}}$**.** There is a positive relationship between middle school students' failure mindset and their attitudes toward challenges.

Research question 3. Do the strategy messages received by middle school students during a setback impact the focus of learning ?

$\boldsymbol{H_{O3}}$**.** The strategy messages received by middle school students during a setback do not have any impact on the focus of learning.

H_{A3}. The strategy messages received by middle school students during a setback impact the focus of learning.

Research question 4. How do instructional practices influence and promote the failure-is-enhancing mindset in students?

a. Based on the students' lived experiences, which instructional practices facilitate the failure-is-enhancing mindset?

b. What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

Research Design

A mixed methods research approach was used in this study to allow the researcher to obtain a better understanding of the events in a classroom and their impact on students' mindset (Creswell, 2014). Mixed method studies involve a combination of quantitative and qualitative data collection. This approach was deemed appropriate as it allows the researcher to explore the relationship between mindset and challenges while including the cultural context of the classroom and the voices of the students. In this study, an embedded approach (see Figure 2) was used to collect data through open- and close-ended survey questions concurrently. Embedded mixed method studies include the convergent or sequential use of quantitative and qualitative data wherein one research format supports the overall design. This study includes two quantitative designs—a correlational component in RQ1 and RQ2 and an ex post facto causal-comparative component for RQ3 using survey research methods. Figure 2 illustrates the larger quantitative study that examines the relationship between growth/failure mindset and student willingness to embrace challenges.

This study also focused on the context of the classroom, quantitatively looking at the impact of teacher feedback on a student's focus on learning. The study examined the voices of students through a qualitative survey tool in addition to quantifying the relationships between mindset and challenges and looking for statistically significant differences in student responses to teacher feedback. The open-ended questions allowed the researcher to identify the instructional practices that help students develop the failure-is-enhancing mindset. Examined together, the quantitative and qualitative findings of this study will enable educational practitioners to understand how the mindset of the individual is related to the interactions and instructional practices of the classroom. These relationships, viewed through the lens of the stage–environment fit theory (Roeser & Eccles, 1998), provides insight as schools make accommodations to meet the developmental needs of students and ensure that students' voices are heard in the work.

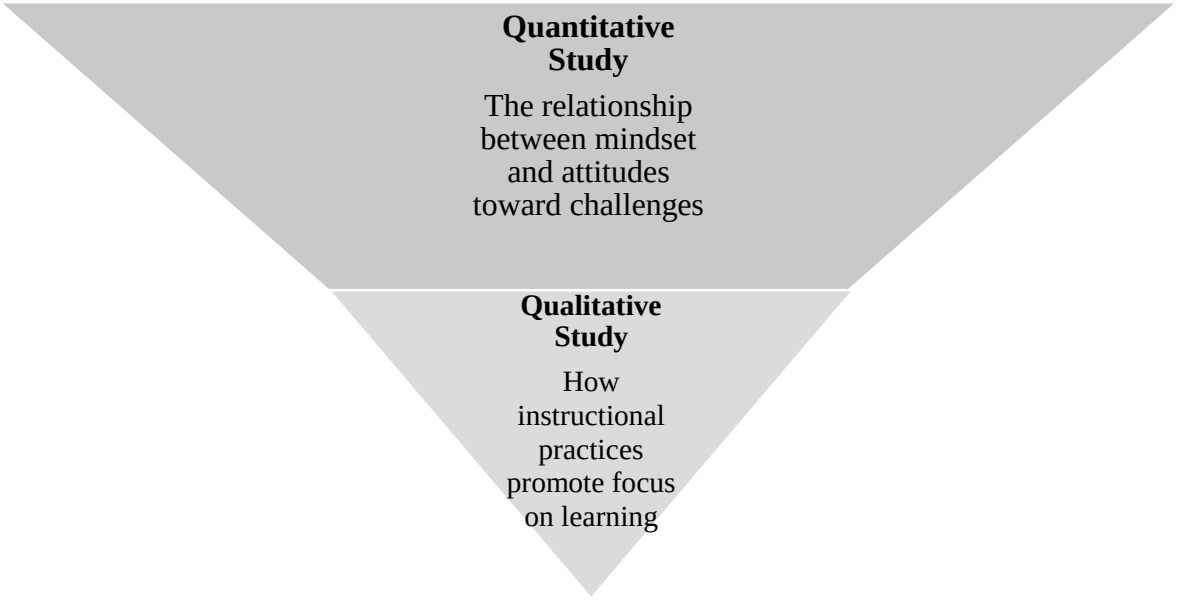

*Figure 2***.** Embedded mixed methods research.

Quantitative Study

The quantitative portion of this study used a survey design. The survey was used to quantify the mindsets, attitudes, and behaviors of a unique population (Creswell, 2014). Surveys are advantageous because they allow the researcher to quickly collect data from a large population and identify trends in the relationships between constructs (Claro et al., 2016). The review of the methodology pointed to the power of quantitative studies in the area of mindsets. Key studies, such as those of Haimovitz and Dweck (2016; 2017), used a survey design that allowed researchers to quantify the relationship between mindset and constructs associated with learning (Creswell, 2014).

The quantitative portion of this study enabled this researcher to examine the relationship, or lack thereof, between the key constructs across a representative sample. This research design allowed the researcher to extend the current knowledge on mindset. The methodology is supported as a viable method in current research. Most of the studies in Chapter 2 used a self-report survey design with individuals from early elementary school through college ages (Haimovitz & Dweck, 2016; Gniewosz et al., 2014). This study uses a similar survey design. A survey was administered to seventh graders to measure the following constructs: growth mindset, failure mindset, attitudes toward challenge, and feedback that facilitates a focus on learning.

The connection between mindsets, both growth and failure, and a student's attitude toward challenge will be observed by this researcher through research questions one and two. These questions examine the potential relationship between the growth and failure mindsets and a student's attitude toward challenge. This study examines the impact that a student's view of intelligence and failure has on their learning. This work is supported by that of Haimovitz and Dweck (2016) in the examination of failure mindset, as it pertains to parents and their children.

The third question in the study explores the impact of feedback, particularly strategy feedback, on a student's growth mindset. It examined how the type of feedback a student receives in class informs their perception of the learning environment and the learner's growth and failure mindsets in that context. This study considers that feedback may or may not impact a student's perception of the learning environment, in addition to their view of themselves as a learner. This aligns with the work of Rattan et al. (2012), who looked at student reactions to feedback at the college level. The study extends the understanding of feedback to younger students, focusing on the middle school classroom and the unique relationship between teachers and students.

Qualitative Study

This study includes a qualitative section to ensure that student voice and their lived experiences are included in the analysis of growth and failure mindset. During the review of methodology, it was observed that most mindset research focused on quantitative research designs. There were, however, some studies that used a qualitative or mixed methods design to include student and teacher perceptions and examine the context of learning. Schmidt et al. (2015) used a mixed methods approach to examine the effectiveness of growth mindset intervention, then included observations and teacher interviews to identify the differences in results by classroom. The study seeks to highlight student voice and perceptions about classroom interactions and teacher feedback. This study, examined through the lens of the stage-environment fit theory (Eccles et al., 1993), ensures that the context of the learning environment is essential. A review of the methodology in Chapter 2 mentions qualitative studies (Barnes & Fives, 2016).

The final research question asks students to describe the instructional practices and classroom procedures that help them work through setbacks while maintaining a focus on learning. The researcher gathered narratives based on the students' lived experiences on which instructional practices facilitate the failure-is-enhancing mindset and which aspects of the classroom culture are necessary for developing this mindset. This final element of data collection was completed at each school site, working with an ontological assumption. Creswell and Poth (2018) explained that an ontological assumption deals with the nature of reality. Taking this assumption into consideration, this researcher will examine multiple perspectives of the reality in the classroom. Open-ended questions were asked by the researcher during the student interviews; this narrative allowed the researcher to include the voice and perspectives of students in the study. A transformative framework was used to gather the perceptions of students, which was then be used to understand how we can better serve early adolescent learners in middle schools. A transformative framework works on the assumption that knowledge is not neutral but is shaped by social relationships, in this case, within the classroom.

The data in this study was collected concurrently in two stages: first, through a single cross-sectional survey administered to seventh graders at the beginning of their second year of middle school, and second, through student interviews at each school site. The researcher's goal was to better understand the failure mindset and its implications for middle school classrooms. The analysis and interpretation of the combined quantitative and qualitative components allowed for a better understanding of the context of the classroom. Once the relationship, or lack thereof, between a student's growth and failure mindset is documented, the researcher examined the instructional strategies and interactions with teachers that influence student's beliefs about failure and challenges. These findings were then examined through the lens of the conceptual

framework to identify the ways in which schools can create learning environments that better support the needs of early adolescent learners.

This study used a mixed methods research design to gain a better understanding of growth and failure mindset in middle school students and how the culture of the classroom impacts its development. The mixed method approach allowed the researcher to quantify the relationship, or lack thereof, between mindset and a student's attitude toward challenges. The researcher ensured that the voices of the students are heard, as their lived experiences were examined along with the academic culture of the classroom. This method also allowed student perceptions about feedback and the culture of the classroom to be heard. The study outlined here examined growth and failure mindset through the lens of the stage–environment fit theory (Eccles et al., 1993), thereby, building a stronger understanding of the relationship between the individuals, interactions, and instructional practices that build a supportive and developmentally appropriate learning environment for early adolescents.

Population and Sample Size

General population. The study examines mindset, instructional practices, and the messages students receive from teachers to identify the ways that middle schools can better meet the developmental needs of early adolescents. For this reason, the general population is middle school students in the metropolitan area of a large city in the Pacific Northwest of the United States. The U.S. Census Bureau has documented approximately 20% of the population living in poverty and racial diversity, which is greater than the poverty population of the rest of the state. Table 1 shows the demographic breakdown of the state, with approximately 85% of the population White, 10% Hispanic, and 5% Asian citizens. While still predominantly White, the metropolitan area demographics vary from the state data, with approximates slightly lower

percentage of Hispanic citizens (< 10%) but more significant percentages of Asian (8%), Black (6%), and Multiracial (5%) citizens.

Table 1

United States Census Data for City and State

	Asian	Black	Hispanic	Multiracial	Pac. Is.	White
State	5 %	<5 %	15 %	5 %	<1 %	90 %
City	8 %	6 %	<10 %	5 %	<1 %	75 %

Targeted population. The targeted population for this study constitutes seventh graders in middle schools across the survey area. The sampling frame is the list of organizations from which the sample could be drawn (Dillman, Smyth, & Christian, 2014). The sampling frame (see Table 2) includes the middle schools in each of the districts in the metropolitan area. Table 2 outlines the number of districts and schools in the sample area from which the sample will be taken as well as the percentage of students on free and reduced lunch. Student demographics will be included, allowing the researcher to ensure that the sample accurately represents the diversity of students in the target population.

Table 2

Sampling Frame for this Study

District	School	Students	F/R %	Asian %	Black %	Hispanic %	Multiracial %	Pac. Is.	White %
A	1	802	55	3	2	39	4	1	51
	2	743	59	6	1	35	7	1	49
	3	734	57	14	2	30	8	2	44
	4	698	68	5	3	49	7	1	35
	5	1060	34	9	2	25	7	2	55
Total		4,037							
B	6	1013	26	8	2	17	10	1	62
	7	956	31	10	3	22	9	1	56

(continued)

District	School	Students	F/R %	Asian %	Black %	Hispanic %	Multiracial %	Pac. Is.	White %
	8	1039	62	9	5	39	6	2	38
	9	918	31	9	2	20	8	1	58
	10	845	45	13	4	33	9	1	40
	11	857	56	8	3	38	7	1	42
	12	1502	11	47	2	7	6	1	42
	13	698	56	5	2	44	6	1	42
Total		6,828							
C	14	953	54	2	1	24	8	1	62
	15	1092	21	18	1	8	9	<1	63
	16	881	36	10	2	17	7	1	62
Total		2,926							
D	17	750	.95	12	15	29	8	3	32
E	18	447	73	18	9	29	8	1	36
	19	582	36	2	12	20	7	<1	57
	20	608	28	14	3	9	12	<1	61
	21	666	24	2	7	9	8	<1	73
	22	716	18	7	3	11	16	1	62
	23	455	26	2	4	11	11	0	73
	24	413	>95	4	21	42	11	2	18
Total		3,887							
Population Total		18,428							

The city in the study is comprised of neighborhoods and suburban areas that differ in terms of demographics. The study includes stratification to ensure that the sample population represents the total population in terms of gender, race, and socioeconomic levels. Stratification requires the researcher to group segments of the sampling frame together based on specific characteristics (Dillman et al., 2014). To ensure accurate representation, the schools were selected from three regions that are a cross-section of the physical geography of the city. These regions will include new suburban developments, inner-city neighborhoods, and outer areas wherein the population is comprised of diverse immigrant populations.

In this study, the researcher selected schools that represent different socioeconomic levels, measured by the percentage of students on free and reduced lunch as well as different racial demographics (Dillman et al., 2014). Three schools were selected from the sampling frame, one with a low percentage of students with free or reduced lunch (10%–30%), one with a high percentage of free or reduced lunch (60%–95%), and one with an average percentage of students with free or reduced lunch (31%–59 %). In each of those schools, students from three randomly selected seventh-grade classrooms will be sampled. This method sampling is to be done in each stratum.

Sampling. In Fall 2019, the paper survey instrument will be distributed to the selected middle schools that represent a cross-section of the geographical distribution. The completed surveys were gathered through non-randomized sampling using the participating schools and classrooms (CIRT, n.d.). As explained in the previous section, schools were selected based on the percentage of students on free and reduced lunch as well as racial diversity. The researcher worked to ensure that the students, classes, and schools in the study represent the overall population. Once the schools were selected, three seventh-grade science classes at each site were randomly selected from a list that identifies sections by teacher and grade level.

Power Analysis

An a priori power analysis was completed to determine the sample size required to obtain sufficient information for a statistically significant data analysis. Details about the power analysis are provided in the following paragraphs. A sample size of 84 students is needed. Taking into account the return rate of surveys from two classes, approximately 30 students were used at each site. Predicting a 50% return rate, the research design calls for the request of consent from 180 students and families, resulting in a sample size of 90.

Power identifies the probability that the results of a study are statistically significant (Cohen, 1988). A power analysis was used to determine the sample size needed for each of the research questions outlined in this study. Research questions 1 and 2 examine the relationship among the variables; Pearson's r correlation is used to analyze the significance of the results. G*power 3.1 was used to determine the sample size needed. An a priori was run using the correlation bivariate normal model. The input parameters included two tails in order to show a significant positive or negative correlation (Quantitative Specialists, 2017). A two-tail statistical test is considered appropriate when a parameter is to exist if there is a difference, in either direction, between the variables (Cohen, 1988). In this case, the null hypothesis will be rejected if a positive or negative difference is found between mindset and a student's attitude toward challenges. The effect size is zero if the null hypothesis is true and an increased value if it is false. The value of the effect size demonstrates the degree of departure from a true null hypothesis. An effect size of 0.3 will be used for this study.

The alpha identifies the risk of reaching the null hypothesis falsely. Since this researcher selected a confidence level of 95%, the significance criterion, alpha, is 0.05 (Cohen, 1988). An alpha of 0.05 predicts a small chance of erroneously rejecting the null hypothesis. Since RQ1 and RQ2 require statistical analysis on the same set of data, the familywise Type I error rate will increase (Napierala, 2012). The familywise error rate refers to the probability of at least one Type I error among the two statistical analyses. In this case, the error rate is 9.75% (Rohmel, 2011). An observed p-value less than 0.025 will be recognized as statistically significant; for this study, power was set at 0.8. This correlates to an 80% chance of correctly identifying a relationship between the variables and if a relationship exists (Cohen, 1988). A Type II error occurs when the null hypothesis is not rejected when a relationship exists—the greater the

power, the lower the chance of a Type II error. In similar studies, 0.8 power is standard. Results of this power analysis showed that a total sample size of 84 is needed to determine significance in each of these studies.

Research question 3 examined the effect of three different forms of feedback on a student's mindset. In order to compare the mean of the response to three different types of feedback, the data in this study was analyzed using an analysis of variance (ANOVA) test. G*power 3.1 was run for an ANOVA: fixed effects, omnibus, and one-way statistical test. The effect size was calculated using the results from the research in the literature review (Rattan et al., 2012); the result was 0.4621027. A 95% confidence level will be used, leading to an alpha of 0.05. A power score of 0.8 lead to the determination that a sample size of 51 is required to ensure that the results are statistically significant.

Instrumentation

The instrumentation for the present study includes a survey tool that was administered to seventh graders at the beginning of their second year of middle school. The quantitative portion of the survey measured growth mindset, failure mindset, attitudes toward challenges, and response to feedback. The qualitative portion asked open-ended questions to gather information about the instructional practices that facilitate mindset development.

Quantitative. In the research reviewed in chapter 2, survey design was established as a viable and reliable method of collecting data on student mindset (Dweck, 1999). Surveys are advantageous because they allow researchers to quickly collect data on a number of constructs using a single instrument (Creswell, 2014). This practice has been seen in studies by Haimovitz and Dweck (2016) and Crum et al. (2013). In these studies, the survey design allowed researchers to examine several hypotheses built on one another to gain a richer understanding of

the relationships between the constructs, how they are developed, and the interactions that affect them.

In this study, growth mindset was measured using the Theories of Intelligence scale (Dweck, 1999). This tool has been used in seminal mindset studies such as Blackwell et al. (2007). Items from the tool have also been included in the work of Haimovitz and Dweck (2016). The survey tool has high internal reliability, with a Cronbach's alpha score ranging from 0.93 to 0.95 (Levy, Stroessner, & Dweck, 1998). The survey tool comprises of six items that include prompts such as "You have a certain amount of intelligence, and you really can't do much to change it" or "No matter who you are, you can change your intelligence a lot." Each item was measured on a six-point Likert scale where 1 indicates that the student strongly agrees with the statement and 6 represents strong disagreement (see Table 3).

Table 3

Survey Scale

1	2	3	4	5	6
Strongly Agree	Agree	Mostly Agree	Mostly Disagree	Disagree	Strongly Disagree

Failure mindset was measured using the Failure Mindset scale (Haimovitz & Dweck, 2016). This survey tool was found while the literature was being reviewed through a close reading of the work of Haimovitz and Dweck (2016; 2017). Haimovitz and Dweck examined the impact of a parent's view of failure on their child's mindset development. The survey tool has been shown to have a Cronbach's alpha score of 0.88. The present study sought to extend the understanding on the interactions in the classroom. The survey tool was comprised of six items that include prompts such as "Experiencing failure facilitates learning and growth" and "Experiencing failure inhibits my learning and growth." Each item was measured on a six-point

Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents strong disagreement (see Table 3).

Students' attitude toward challenges was examined with the Short Grit scale (Grit-S). The variable includes two affective traits—interest and effort. These traits were examined in the work of Aditomo (2015) and DeCastella and Byrne (2014). These studies focused on a student's ability to follow an interest, take on an academic challenge that would require extended effort, overcome a setback, work hard, and persist until the conclusion. The 9-item survey tool, developed by Duckworth and Quinn (2009), incorporates all these characteristics to quantify a student's response to challenge. This survey tool has acceptable internal reliability, with alpha scores ranging from 0.73 to 0.83 (Duckworth & Quinn, 2009). The instrument used in this study was modified to specifically measure interest and persistent effort and ensure that the questions are accessible to early adolescent students. The prompts included items such as "I finish whatever I begin" and "Setbacks don't discourage me." Each of the survey prompts were measured on a six-point Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents strong disagreement (see Table 3).

Students' responses to strategy feedback was the final variable included in the quantitative portion of the survey. This researcher used the work of Rattan et al. (2012) in developing the measurement tool. Rattan et al. (2012) used a scenario to divide the students into experimental groups: comfort feedback, strategy feedback, and a control group. Using the original scenario, this researcher adapted the content and language to early adolescents. After reading the scenario and the selected feedback, the university students answered 12 items that measured their growth mindset within that specific context.

The survey tool used to quantify a student's ability to focus on learning was modeled after the original Rattan et al. (2012) study. Rattan et al. (2012) used four items from the Perceptions of an Environmental Entity Theory scale (PEET), which measures student perceptions of the learning environment as a result of the type of feedback they receive (Rattan et al., 2012). This instrument has an alpha of 0.96. The four questions from the PEET survey were modified slightly to link each statement to the context of the science classroom. This modified tool will include statements such as "My teacher believes that I have a certain amount of science intelligence and I can't really do much to change it."

In addition to the student perception of the learning environment, this study examined students' growth and failure mindsets within a context in the definition of a focus on learning. In order to quantify growth mindset in the context of the science classroom, four survey items were taken from the modified version of the Theories of Intelligence scale (Dweck, 2000). These items asked students to identify their beliefs about their ability to improve their intelligence in science. Questions included "If you are not good at science you really can't do much to change it" and "Your intelligence is something about you that you can't change very much." The last four items of the tool were a modified version of the Failure Mindset scale that asks students to identify their beliefs about their ability to learn from failure in science (Haimovitz & Dweck, 2016). Questions included "Failure in science help me learn and grow" and "Failure in science hurts my learning and growth." Each of the items in the survey tool were scored on a six-point Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents strong disagreement (see Table 3).

Qualitative. The final segment of the instrument was designed to explore how instructional practices in the classroom facilitate failure mindset. This researcher seeks to elicit

students' voice and reflections on the interactions and instructional strategies that facilitate the failure-is-enhancing mindset. This was done through open-ended qualitative interview questions, which were gathered by this researcher at each school site. In order to gather information about the students' lived experiences, the researcher used a phenomenological method rooted in the framework of social constructivism (Creswell & Poth, 2018). The instrument aims to gather the information that answers the following questions:

- Based on a student's lived experiences, which instructional practices facilitate the failure-is-enhancing mindset?
- What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

The survey tool and interview questions developed for this study allowed the researcher to quantitatively examine the relationships between the growth and failure mindsets and a student's willingness to embrace challenges. Student voice and lived experiences were included in the analysis and findings using an embedded qualitative survey tool. This mixed methods instrument allows the researcher to examine the ecological factors in the learning environment, instructional practices, and the feedback messages that keep students focused on learning and growth through the analysis of both forms of data (Creswell, 2014).

Data Collection

After receiving approval from the IRB board, permission was requested from the participating districts and school principals and signed consent were collected from both students and parents. The study focused on science classrooms in the metropolitan area of a large city in the Pacific Northwest of the United States of America in Fall 2019. Three schools were selected, each representing a different socioeconomic level as measured by the percentage of students on

free and reduced lunch and other demographic parameters. Schools in the sample frame were classified by the percentage of students on free and reduced lunch: low (10%–29%), medium (30%–49%), and high (50%–95%). The researcher also be selected schools with student diversity that is representative of the overall population of the metropolitan area.

Once the building level permission has been granted, three seventh-grade science classes from each school were randomly selected to be sampled. The survey was administered in their science classrooms. The science teachers in the sample classrooms administered the survey (in a paper format) to students following a set protocol. Teacher administration was selected as opposed to a research assistant to minimize the bias due to acquiescence (Dillman et al., 2014). The teachers had spent time with the students, building relationships and trust and, therefore, have been identified as the facilitator who would result in the most accurate responses.

The nature of the survey could lead to a misrepresentation in the self-report format based on the race, gender, age, and effect of the research assistant. The students in the sample answered 34 questions that gathered quantitative data and student perceptions of lived experiences in the following areas: growth mindset, failure mindset, attitudes toward challenges, response to feedback. The questions also explore the instructional practices that facilitated mindset development.

A paper survey tool was used to account for the availability of different resources in different schools and districts. The paper format also addresses the varying comfort levels students may have with technology and decreases the need for facilitator involvement in the process (Fowler, 2014). Using a class roster, each student who provides consent was assigned a research number. This number allowed the researcher to identify their demographic characteristics without linking that information to the actual survey tool. The research number

was essential for the qualitative portion of the study to ensure the purposeful sampling of a heterogeneous sampling population (Creswell & Poth, 2018).

Self-administered surveys are best-suited to this study as they allow the students to respond honestly without the fear of having to admit characteristics they may perceive as undesirable (Fowler, 2014). Students were able to complete the survey in 15–20 minutes. The survey was administered in their classrooms, with their teacher as the facilitator. Once completed, the surveys were collected in a sealed manila envelope to prevent their responses from being accessible at the building level, ensuring anonymity for students. All the surveys and sample information were stored in a locked closet in a locked room. At the time of the survey, the researcher interviewed 5 students at each site. Through the interview questions, the researcher asked the students to describe the interactions, feedback, and instructional practices in their classroom that help them take on a challenge and view a setback as part of the process of learning. These interviews were conducted by the researcher at each school site.

The data were compiled manually in an Excel spreadsheet. The data from the spreadsheet were then be extracted for quantitative statistical testing or qualitative analysis. The statistical tool SPSS was then used for analysis. The final research question seeks to include student voice and lived experiences. The narratives, once gathered, were examined through a process outlined by Creswell and Poth (2018). This allowed the researcher to gain a clearer understanding of the student's views of classroom practices and their impact on learning and the learning environment. This protocol is described in further detail in the following section.

Operationalizing Variables

The present study focuses on growth and failure mindsets to determine the impact these variables may have on a student's willingness to embrace challenges. In addition, the

instructional practices and messages that keep students focused on learning and growth have also been studied.

Independent variables.

***Strategy messages*.** This variable considers the informal feedback that teachers give students and the impact on their mindset and focus on learning. For this study, feedback was classified into three categories: comfort feedback, strategy feedback, and control (Rattan et al., 2012). Comfort feedback strives to make students come to terms with failure and recognize that they possess talents in other areas. Strategy feedback encourages students to reflect on the strategies they used in their learning process and suggests alternative steps that can be taken to master the skills needed to be successful in the future. Strategy messages were operationalized, starting with the original Rattan et al. study. The language and context were modified to make it accessible and appropriate for early adolescents in a seventh-grade science classroom. When presented with a scenario of a failed science test, the students will be provided one of the three types of feedback—one meant to comfort and highlight talents in different areas, one meant to focus on changing strategies for learning, and the third for control. After reading the scenario and one type of feedback, a survey tool was used to examine the student's focus on learning within the context of the science classroom.

Table 4

Teacher Feedback Presented in Survey Tool

Feedback Type	Feedback Presented in Study
Comfort Feedback	"I want to assure you that I know you are a talented student in general. Not everyone is good in science, but I want you to remember how good you are in other subjects. I want to assure you that I really care, so let's stay in contact about how you're doing in class."

(Continued)

Feedback Type	Feedback Presented in Study
Strategy Feedback	"I want to assure you that I know that you are a talented student. I want you to change your study strategy and maybe work with the tutor in the library. I want to assure you that I really care, so let's stay in contact throughout this next unit about how you're doing in class."
Control Feedback	"I want to assure you that I know you are a talented student in general, and I want to assure you that I really care, so let's stay in contact about how you're doing in class."

Dependent variables.

Growth mindset. In this study, growth mindset was operationally defined as a student's view of intelligence as malleable (Dweck, 2006). Dweck (2016) classified the implicit theories of intelligence, in terms of an individual's unconscious belief regarding their ability, as either growth or fixed mindset. Students with growth mindset believe that with persistent effort, effective strategies, and feedback from others, intelligence can be developed over time. Information regarding this variable was gathered using the Theories of Intelligence scale. The survey tool includes six items that are highlighted in Table 5. Each of the items was measured on a six-point Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents that the student strongly disagrees. The scores for items measuring fixed mindset were reverse-coded so that a single total score can be calculated with a high score, which represents stronger growth mindset (Haimovitz & Dweck, 2016).

Table 5

Survey Items for Growth Mindset

Growth Mindset	• You have a certain amount of intelligence, and you really can't do much to change it. • Your intelligence is something about you that you can't change much. • You can learn new things, but you can't really change your basic intelligence. • No matter who you are, you can change your intelligence a lot. • You can always greatly change your intelligence. • No matter how intelligence you have, you can always change it quite a bit.

Failure mindset. The second variable operationalized in this study was failure mindset. Failure mindset is a unique variable that is not associated with the fixed mindset. Individuals with fixed mindset view intelligence as unchangeable. In this study, failure mindset is defined by a student's belief in the role of failure in the learning process. There are two types of failure mindsets: failure-is-enhancing and failure-is-debilitating (Haimovitz & Dweck, 2016). Haimovitz and Dweck (2016) described the failure-is-enhancing mindset is defined as the degree to which a student believes that failure facilitates learning and enhances performance. Students with the failure-is-enhancing mindset view setback as an opportunity to gather feedback, learn new strategies, and extend learning, while those with the failure-is-debilitating mindset view failure as an experience that inhibits learning and limits productivity. A student with the failure-is-debilitating mindset views failure or setback as evidence of their limitations that cannot be overcome.

The Failure Mindset scale used by Haimovitz and Dweck (2016) was used in this study to gather student data regarding their failure mindset. This survey tool included six items that are highlighted in Table 6. Each item was measured on a six-point Likert scale, where 1 indicates

that the student strongly agrees with the statement and 6 represents that the student strongly disagrees. The scores for items measuring the failure-is-debilitating mindset were reverse coded so that a single total score can be calculated with a high score representing stronger failure-is-enhancing mindset.

Table 6

Survey Items for Failure Mindset

Failure Mindset	• The effects of failure are positive and should be utilized. • Experiencing failure facilitates learning and growth. • Experiencing failure enhances my performance and productivity
	• Experiencing failure inhibits my learning and growth. • Experiencing failure debilitates my performance and productivity. • The effects of failure are negative and should be avoided.

Attitude toward challenges. This variable was operationalized to include two affective traits—interest and effort. For this study, attitude toward challenges is defined as a student's ability to follow an interest and take on an academic challenge that requires extended effort (Aditomo, 2015). The abilities to overcome a setback, work hard, and persist until the conclusion are also included in this variable (DeCastella & Byrne, 2014). The 12-item Grit-S, developed by Duckworth and Quinn (2009), was used to measure students' attitude toward challenges. The survey instrument was modified to specifically measure interest and persistent effort, ensuring that the questions are accessible to early adolescents. Table 7 highlights the items included in the survey tool. Each of the survey prompts was measured on a six-point Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents that the student disagrees strongly. A high score on this element will be evidence of a positive attitude toward challenges.

Table 7

Survey Items for Attitude toward Challenge

Willingness to Embrace Challenge	• I finish whatever I begin; setbacks don't discourage me. • I am diligent; I have achieved a goal that took years of work. • I have overcome challenges. • I have difficulty maintaining my focus on projects. • I often set a goal but later choose to pursue a different one.

Focus on learning. This study examines the connection between feedback and a student's focus on learning. In this study, focus on learning is defined as a student's growth and failure mindsets within the context as well as the student perception of the learning environment. The surveys in this study were conducted in science classrooms and facilitated by the students' science teacher. The scenario and feedback presented to the students was also set within the context of the science classroom. The items in the survey were written to speak specifically to the context and the class they were participating in. Focus on learning was examined using a 12-item survey (see Table 8).

The survey tool included four items from the PEET scale, which measures student perception of the learning environment as a result of the type of feedback they receive (Rattan et al., 2012). Four of the survey items were taken from a modified version of the Theories of Intelligence scale (Dweck, 2006), they ask students to identify their beliefs about their ability to modify their intelligence when it comes to science. The last four items of the survey were taken from a modified version of the Failure Mindset scale (Haimovitz & Dweck, 2016), they ask students to identify their beliefs about their ability to learn from failure in science. Table 8 includes examples of the items in each area that will be included in the survey. Each of the items in the survey was scored on a six-point Likert scale, where 1 indicates that the student strongly agrees with the statement and 6 represents strong disagreement. The scores for items measuring

the failure-is-debilitating and fixed mindsets were reverse coded so that a single total score can be calculated with a high score representing stronger growth or failure-is-enhancing mindset.

Table 8

Survey Items for Focus on Learning

Perceptions of Environmental Entity Theory	• My teacher believes that I have a certain amount of science intelligence, and I can't really do much to change it.
Growth Mindset in Context	• If you are not good at science, you really can't do much to change it. • Your intelligence is something about you that you can't change much. • No matter who you are, you can change your intelligence a lot. • You can always greatly change how much you understand science
Failure Mindset in Context	• Failures in science help me learn and grow. • Experiencing failure in science helps my productivity and performance. • Failure in science hurts my learning and growth. • Experiencing failure in science hurts my productivity and performance.

This study examines the relationships between the growth and failure mindsets and a student's attitude toward challenges. It also examines the ecological factors in the learning environment, instructional practices, and feedback messages that keep students focused on learning and growth. Examining the correlation between the variables outlined here allowed the researcher to view them through the lens of the stage–environment fit theory (Eccles et al., 1991) to determine if those interactions play a moderating role in creating a bridge between the developmental stage and the new middle school learning environment.

Data Analysis Procedures

Quantitative. The research design for this study requires both quantitative and qualitative data. Segments of the data were extracted from the Excel spreadsheet for statistical analysis or coding. The procedures for each of those analyses are described below.

Survey data was gathered and compiled by hand in an Excel spreadsheet. This raw data was then cleaned to detect statistical outliers. Each step of this process was designed to help ensure that data quality was maintained (Hellerstein, 2008). First, each column or variable included in the sample will be examined. Hellerstein (2008) explained that in this process, each column needs to be examined individually to identify the data points that are far from what is expected based on the rest of the collected data. This step helped identify any data entry errors caused by the nature of human data entry. Once the outliers were detected, the survey number assigned during sampling will be used to check if the accuracy had been impacted by human error. If the outlier was a result of a data entry error, a correction would be made at this point.

The next step in the data cleaning process was the calculation and analysis of descriptive statistics. This step allowed the researcher to use summary statistics, including mean and standard deviation, to analyze the data sets for outliers (Hellerstein, 2008). The minimum, maximum, and median for each column were identified, and the mean, standard deviation, and variance were calculated. These statistics provided an objective view of the data points to identify those that lie outside the normal range of responses. The outliers were scores falling outside of the two standard deviations from the mean. These were removed from the data set, and the cleaned data will then be extracted for quantitative statistical testing.

Student scores for the three variables—growth mindset, failure mindset, and willingness to embrace challenges—were then entered into an SPSS data table. Descriptive statistics,

including mean and standard deviation, will be calculated for each of the variables. Data regarding these three variables were analyzed using a Pearson's r statistical test to determine the correlation between growth mindset and a student's willingness to embrace challenge as well as that between failure mindset and a student's willingness to embrace challenges (Ayiro, 2012).

Prior to calculating the Pearson's r correlation, the data was analyzed to test the following assumptions: (a) the variables are continuous, (b) there is a linear relationship, (c) the variables are normally distributed, and (d) there are no outliers (Ayiro, 2012). Assumption testing was done using the SPSS program. A scatterplot allowed the researcher to test for linearity, a boxplot was used to identify the outliers, and a Shapiro–Wilk test provided a test of normality within the distribution data. In this case, a Pearson's *r* correlation was appropriate because the two variables were measured at the interval level rather than including two ordinal variables used in a Spearman correlation or including a dichotomous variable as in the Point–Biserial correlation.

To determine the correlation between the growth mindset and a student's willingness to embrace challenges, this study used the Theories of Intelligence scale (Dweck, 2000). This survey tool included six items that measured a student's growth mindset. Students' attitude toward challenges were examined using the Grit-S. The 12-item survey tool measured a student's ability to follow an interest, take on an academic challenge that would require extended effort, overcome setbacks, work hard, and persist until the conclusion. The researcher ran a statistical analysis to examine the relationship between growth mindset and a student's willingness to embrace challenges. Pearson's *r* statistical test was used to investigate the relationship between two variables (Ayiro, 2012). The data was analyzed through a bivariate correlation in order to create a scatter plot and calculate *r* to determine the potential presence and strength of a correlation.

Research question 2 examines the correlation between failure mindset and a student's willingness to embrace challenges. A second analysis, following the data analysis procedures outlined above, examined the relationship between a student's failure mindset and willingness to embrace challenges. For this research, mindset data was collected using the Failure Mindset Scale (Haimovitz & Dweck, 2016). This survey tool was comprised of six items that included prompts such as "Experiencing failure facilitates learning and growth" and "Experiencing failure inhibits my learning and growth." The procedures outlined for RQ1 and RQ2 are consistent with the work of Haimovitz and Dweck (2016).

Research question 3 examines the impact of three types of feedback on student's focus on learning. Student scores for each of the types of feedback—comfort feedback, strategy feedback, and control—were entered into an SPSS data table. Descriptive statistics, including the mean and standard deviation, were calculated for each of the three portions as well as the overall total of the survey for the three types of feedback. The survey tool asked students to answer 12 items that measured their growth mindset within that specific context. The overall mindset score measured the student's ability to focus on learning. The survey includes 4 items from the PEET scale, which measure student perception of the learning environment (Rattan et al., 2012), four survey items from a modified version of the Theories of Intelligence scale that ask students to identify their beliefs about their ability to change their own intelligence in terms of science (Dweck, 1999), and four items from a modified version of the Failure Mindset scale that asks students to identify their beliefs about their ability to learn from failure in science (Haimovitz & Dweck, 2016). These procedures are consistent with the work of Rattan et al. (2012).

To compare the means of the response to each type of feedback, an analysis of variance (ANOVA) was used. Rutherford (2011) explained that an ANOVA is a method of inference used

to test whether there is a statistically significant amount of variance between variables. In this case, the one-way ANOVA allows the researcher to compare the response of feedback between students in the two experimental groups as well as the control. The ANOVA was completed with the means of the overall scores of each feedback type. This ANOVA worked with a set of assumptions: (a) randomization of the samples, (b) experimental errors are normally distributed, and (c) there is equal variance between treatments. The randomization of the samples addresses when the feedback types are assigned during the survey administration; this assignment was randomized with no apparent pattern. The Shapiro–Wilk test tests the assumption of a normal distribution, while the Levene's test tests the assumption of equal variance. This analysis procedure provides insight into the impact that different types of teacher feedback have on student mindset and focus on learning.

Qualitative. The qualitative portion of this study was designed to allow the researcher to explore and construct an understanding of students' experiences in the classroom and how instructional practices impact their ability to focus on learning (Creswell, 2014). Creswell and Poth (2018) have outlined six steps in the data analysis process: managing and organizing data, reading and memoing emergent ideas, classifying codes and themes, developing and assessing interpretations, representing and visualizing data, and accounting for findings.

First, the responses to the open-ended qualitative questions were transcribed into a word document and scanned for outliers and answers that are anomalies. The responses were then examined during a preliminary read-through (Creswell & Poth, 2018). To analyze this qualitative data, the researcher used highlighting and margin notes to elicit the salient pieces of information and identify trends. During this process, the researcher read for positive as well as negative comments about instructional strategies and the classroom to ensure multiple perspectives and

comprehensive findings. After the first read-through, the researcher wrote a reflective passage to summarize the notes, which were then be used to identify codes.

The second read-through of the notes was done to code the responses. Coding is a key step in making sense of the narratives of the students (Creswell & Poth, 2018). Following the recommendation of Creswell and Poth (2018), lean coding was used. This calls for only five or six codes to begin. Once this is done, the researcher determined the frequency of each code and group related codes into larger categories.

The data analysis procedures outlined in this section have been designed to ensure that the analyzed data accurately represents the information provided by the students in the sample and is able to represent the larger target population. The combined analysis of the quantitative and qualitative portions provide a holistic view of the relationships between mindset, attitude toward challenges, and the interactions within the classroom. Beyond the initial correlation between the growth and failure mindsets and students' attitude toward challenges, the qualitative portion of the analysis brings out the student voice to identify the instructional practices and interactions that lead to the failure-is-enhancing mindset.

To ensure that this researcher's bias does not impact the analysis and interpretation of the narrative collected during the interviews, member checking was done throughout the data collection and analysis process. Member checking in this study included the study participants, the researcher, and the individuals outside the study who acted as auditors (Carlson, 2010). The first round took place at the completion of the interview with each participant (Creswell & Poth, 2018). A review of the responses at the end of each interview allowed this researcher to check the accuracy of the transcription and ensure that the emphasis of the student's experience is accurately understood. During the process of data analysis, member checking involved a

professional colleague acting as an external auditor. This colleague had no connection to the study, and they reviewed the data as well as the codes and themes that have been identified to examine the process as well as the product.

Delimitations and Limitations

Delimitations. Delimitations are factors that the researcher believes may impact the outcomes of a study (Simon, 2011). This researcher has identified the following delimitations: (a) self-report format of the survey, (b) open-ended qualitative questions included in the survey, and (c) data analysis that describes correlation rather than causation.

The researcher designed the survey method to allow students themselves to report their beliefs about their mindset, attitude toward challenges, and their response to feedback. This delimitation has been identified in several of the studies in Chapter 2 (for instance, Schmidt et al., 2015; DeCastella & Byrne, 2014). However, while students may be hesitant to provide honest responses, some studies have shown that it is possible to obtain statistically significant results that can be used to relate back to the larger population using the self-report method.

Fowler (2014) stated that self-report open-ended questions often do not produce useful data, since there is no interviewer there to probe and ask clarifying questions. This is particularly important for the qualitative portion of a study. This researcher has decided to gather information through open-ended questions in the survey rather than including interviews that would allow for clarification and follow-up questions. In this study, the researcher prioritized the diversity of respondents, being of the opinion that the narratives gathered from each of the 84 students in the sample would better allow trends to be identified. The results here were used anecdotally to include student voice in the study, identify potential best practices, and determine the direction of future studies.

Another delimitation of this study is that it uses data analysis procedures (Simon, 2011). The data analysis procedures described in an earlier section outlined the statistical analysis that examined the relationship and correlation between variables. When examining the relationship between growth and failure mindsets and a student's willingness to embrace challenges, such analysis procedures determine the presence, or lack thereof, between the variables. Since the results in this study are correlational, they do not show causality. Haimovitz et al. (2011) explain the worth of information about correlations between variables, which can be used as predictive indicators in our work in schools. The findings were examined through the lens of the conceptual framework, highlighting the potential relationship between mindset and a student's willingness to embrace challenges as well as the impact of the interactions and instructional practices in the classroom. The findings may provide educators and schools insight as they work to create supportive learning environments that meet the developmental needs of students, especially early adolescents.

The research design of the study is the final delimitation (Fowler, 2014). Convenience sampling in the classroom and the building level eliminates the possibility of random sampling. This research ensures that the schools included in the study have demographics that increase the likelihood for the sample to represent the overall population. The sample was comprised of schools with racial diversity as well as those with different levels of poverty, including one with a low percentage of students on free or reduced lunch (10%–30%), one with a high percentage of students on free or reduced lunch (60%–95%), and one with an average percentage of students on free or reduced lunch (31%–59%).

The research design for this study is based on decisions made by this researcher that may potentially impact the findings (Simon, 2011). These delimitations include the self-report format

of the survey, format of the qualitative questions, data analysis procedures, and the use of convenience sampling. The researcher will keep the focus in sampling procedures on efforts to obtain honest responses from a diverse sample that represents the total population.

Limitations. Limitations refer to the factors in a study that are out of the control of the researcher and may potentially affect the findings of the study (Simon, 2011). The limitations of this study may be concerned with the following categories: (a) the districts and schools that agree to take part, (b) the students and families who give consent, and (c) the instrumentation of the survey.

The first limitation concerns the districts and schools included in the study (Simon, 2011). As mentioned earlier in this chapter, the sample frame includes several school districts across a large metropolitan area. The study aimed to incorporate classes from different schools from the sample frame. The limitation may arise from the districts that provide permission for the study and the schools that decide to join the sample. This may impact the level of student diversity, based on race and socioeconomic status, in the sample. This limitation could influence the results' ability to reflect the general population.

Student and parental consent may also be a limitation in this study (Simon, 2011). The researcher reached out to different schools and student populations to gather data that represents the total population. The rate of consent and the demographics of the parents and students giving consent could impact the overall results and limit the multiple perspectives, which are the goal of the study. In order to make families comfortable with participation, the information provided about the study was clear and comprehensive and translated into the home languages of the families.

Finally, the instrument may impact the overall results (Simon, 2011). The text and format of the instrument may have an unintended effect on results. The tools in the survey have been tested by researchers in previous studies (for instance, Dweck, 1999; Haimovitz & Dweck, 2016; Duckworth & Quinn, 2009; Rattan et al., 2012). Since this study focuses on seventh graders, the researcher has modified the items in the survey to make them accessible to young students. The language level is appropriate for their developmental stage, which ensures comprehension. Students who understand the goal of the study and the fact that their anonymity is protected and feel valued for their opinions on the educational transition they are experiencing will be more likely to be truthful in their responses.

Limitations, such as the participating schools and districts, demographics of the students and families who provide consent, and the survey tool, may impact the results of the study (Simon, 2011). Efforts were made to ensure that the sample in the study represents the general population as closely as possible. The efforts include sampling at several schools with varying demographics, determined by both race and socioeconomic level, communication plans, and a grade-appropriate accessible survey tool. With these considerations in place, the results of the study are expected to represent relationships more accurately for the target population.

Internal and External Validity

This mixed methods study seeks to extend the current understanding of the relationship between an individual's mindset on the attitude toward challenges as well as the classroom interactions and instructional practices that create a classroom culture with a focus on learning (Creswell, 2014). To ensure that the findings in this study can be generalized to the larger population, efforts have been made to account for threats to the internal and external validity of the quantitative and qualitative portions.

Quantitative. The research design for the quantitative study seeks to describe the relationship between mindset and a student's attitude toward challenges as well as the impact that teacher feedback has on the mindset of students. There are internal and external sources of potential errors that may impact the researcher's ability to accurately draw conclusions about the relationship between variables. There are two types of threats to the validity of this experiment—internal and external (Creswell, 2014). The sources of threats to both internal and external validity have been outlined below, along with the actions that this researcher will take to limit the same.

Internal validity threats refer to the procedures or experiences of participants that limit the researcher's ability to make inferences from the data collected (Creswell, 2014). The internal threats in this study are selection and testing. The threat due to the sample selection process stems from the fact that the research design uses convenience sampling and not random sampling. As a result, the selected participants may have characteristics that predispose them to certain answers and outcomes. To reduce this threat, schools for sampling were selected from three different demographic groups on the basis of the percentage of students on free and reduced lunch as well as race. From each of the schools selected, two science classes will be randomly selected for sampling. These steps increase the probability that those sampled more closely represent the target population.

The second threat to internal validity is testing. To reduce this threat, sampling was done during the first quarter of the students' seventh grade. This will also be the time that the students will participate in district wide benchmark assessments and statewide standardized testing. This may result in testing fatigue, which could impact the honesty and effort from students during the survey. To reduce the impact of this threat, the survey was completed in the science classroom,

as science has fewer testing requirements. Limiting the testing fatigue increases the likelihood that the relationships between the variables will be able to identify patterns in the target population.

External validity threats result from the researcher making incorrect inferences from the data collected (Creswell, 2014). The external threat to validity in this study centers on the interaction between the setting and treatment. The characteristics of the city of the sampling may generate responses that cannot be accurately generalized to other settings. The researcher has taken steps to reduce this threat by ensuring that the schools that participate in the survey represent diverse and unique populations in the city. This diversity increases the likelihood of the results to be generalized for students in other locations.

The reliability and validity of the instrument was determined through exploratory factor analysis. The exploratory factor analysis allows the researcher to identify the associations between the survey items and determine if they can measure a single construct or more than one construct (Farbrigar & Wegener, 2011). Since the survey tool includes several instruments that measure multiple constructs, the exploratory factor analysis allows the researcher to examine the inter-correlations and identify the items that can be used in the data analysis (Chen, 2012).

Qualitative. In the quantitative portion of this study, this researcher attempts to ensure the validity and reliability of the data collection and analysis. The goal is for student voice and opinions to be included in a way that increases our understanding of the interaction and instructional practices in the classroom that contribute to mindset development in sixth graders (Creswell & Poth, 2018). The following precautions help ensure the trustworthiness and dependability of the findings.

Qualitative validity requires the researcher to incorporate checks for to ensure the accuracy of the findings through procedural decisions (Creswell, 2014). The validation strategies used in this study are as follows: (a) clarifying research bias during the data collection and analysis process and (b) corroborating evidence through multiple data sources (Creswell & Poth, 2018). The first strategy was implemented as this researcher wrote to identify the biases inherently brought to the study. These biases may be a result of personal teaching philosophies and past experiences in classrooms. The writing activity brings these to the forefront in order to ensure that they have a limited impact on the analysis of data. Second, the corroborating evidence used in this study are the findings from research question 3, which examines the impact of feedback, the narratives collected from the qualitative questions, and the corroborating evidence found in similar studies in the literature review.

Qualitative reliability indicates that the approach a researcher has taken to gather and analyze data is consistent with the current research (Creswell, 2014). The coding process of a qualitative study is the key to ensuring reliability during analysis. The analysis of the narrative collected in the qualitative portion of this study was coded and analyzed solely by this researcher to ensure that the coding is consistent. A codebook was created, including the definition of each code and the sample text assigned to each code. This provides a resource for the researcher to recalibrate throughout the coding and analysis process. After the qualitative data is analyzed, the results were validated through a member checking process. According to Birt, Scott, Cavers, Campbell, and Walter (2016), member checking is a method to counter the bias inherent in a researcher and ensure the reliability of the findings. The audit approach to the member checking required the researcher to explore the themes that have emerged from data analysis to explore the beliefs and attitudes of students with similar experiences.

In the first quarter of their seventh grade, the students were surveyed to determine the relationship between mindset and attitude toward challenges as well as the interactions and instructional practices that impact mindset development. This mixed methods study seeks to extend the current understanding of how the interactions between student mindset and teacher feedback and instructional practices improve the stage–environment fit for early adolescents (Roeser & Eccles, 1998). This researcher has included the strategies described here to ensure that the findings in this study can be generalized to the broader population and maintain internal and external validity and the reliability of the findings.

Expected Findings

The survey design used in this study collected data on growth mindset, failure mindset, attitude toward challenges, response to feedback, and gathered narrative information about instructional practices that facilitate mindset development. The expected findings in relation to each of the research questions are outlined below.

RQ1. Is there a relationship between middle school students' growth mindset and their attitude toward challenge?

The anticipated results include the identification of a relationship between middle school students' growth mindset and their attitude toward challenges. This researcher predicted a positive relationship between the two variables. The literature reviewed in Chapter 2 highlights the link between the mindset and the internal attributes of the learner. These internal attributes include intrinsic motivation (Dweck, 2006; Haimovitz et al., 2011), academic emotions (King, 2012), self-efficacy (Davis et al., 2011), and resiliency against stereotype threat (Dweck, 2006). Each of these internal factors impacts the student's self-concept, sense of belonging, and willingness to seek and receive feedback. These results demonstrate the power of mindset to

meet the developmental needs of early adolescents as they transition to middle school. These results, outlined in the current research, lead the researcher to predict that a student with growth mindset will be more likely to embrace challenges.

RQ2. **Is there a relationship between middle school students' failure mindset and their attitudes toward challenges?**

The current research on failure mindset leads this researcher to predict that the data would show a relationship between middle school students' failure mindset and attitude toward challenges. The data were expected to indicate that this is a positive relationship. Research has identified two types of failure mindsets—failure-is-enhancing and failure-is-debilitating. Students with the failure-is-enhancing mindset view challenges as an opportunity to learn and improve and, therefore, embrace the struggle. The current research, included in Chapter 2, highlights the fragility of students' self-efficacy (Davis et al., 2011) as they transition into middle school as well as the significance of the feedback received from trusted adults (Haimovitz & Dweck, 2017; Friedel et al., 2010). These external variables may impact the results found in this portion of the study.

RQ3. Do the strategy messages received by middle school students during a setback impact the focus of learning?

The study by Rattan et al. (2012) described how a college student's view of intelligence was related to their belief of their ability and how this translated to their perception of themselves as learners. These findings led this researcher to predict that the results would be similar in sixth graders. The importance of feedback was also highlighted in the work of Haimovitz and Dweck (2016), who described the impact of a parent's failure mindset on their child's view of the malleability of intelligence. Shim et al. (2013) and Barnes and Fives (2016) looked specifically

at teachers—how their mindset impacted the instructional strategies used—and the explicit and implicit messages students receive in the classroom. It was anticipated that there would be a statistically significant difference between the messages middle school students receive and their focus on learning. When provided comfort, strategy, or control, the students who receive strategy feedback were predicted to have a significantly higher mean score measuring their focus on learning.

RQ4. How do instructional practices influence and promote the failure-is-enhancing mindset in students? Based on a student's lived experiences, which instructional practices facilitate the failure-is-enhancing mindset? What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

From the review of methodology in Chapter 2, it is evident that most of the studies focused on mindset have been quantitative. However, a few studies have used a qualitative or mixed methods design. Of these studies, the work of Schmidt et al. (2015) highlights the advantages of a mixed methods approach. In their study, classroom observations and teacher interviews allowed them to gain a clearer understanding of the variables that impacted the results of a growth mindset intervention (Schmidt et al., 2015). This study highlighted the power of the teacher and the implicit and explicit messages in the classroom. RQ4 is included in this study to bring the student voice to the forefront.

Through the qualitative portion of this study, the researcher expects to gain a deeper understanding of the ecological factors in the classroom, primarily the teacher's feedback and instructional practices, which impact the student's mindset and the view of failure as an enhancing event in the process of learning (Creswell & Poth, 2018). This researcher anticipates that the students would identify strategy feedback, along with student-centered inquiry activities,

as one that leads to a great failure-is-enhancing mindset. This researcher recognizes that there may be some bias in this prediction based on past professional and classroom experience. During the data analysis process, this researcher incorporated the corroborating evidence—the findings from research question 3, which examines the impact of feedback, the narrative collected from the qualitative questions, and the corroborating evidence found in similar studies in the literature review.

This mixed methods study surveys students to gain insight into the relationships between growth and failure mindsets and a student's attitude toward challenges (Creswell, 2014). It also examines the culture of the classroom and how the interactions and instructional practices influence a student's mindset through feedback and instructional practices. The findings of the study highlight ways that educators and schools can provide developmentally appropriate support to early adolescents transitioning from elementary to middle school.

Ethical Issues in the Study

During the development of the current study, this researcher paid attention to the ethical issues that may arise in this study. Creswell (2014) highlights the need to protect the research participants and ensure that integrity is maintained in every step of the research process. This study took ethical issues into consideration during the development, sampling, and data analysis phases. Each decision made throughout the process was to increase the reliability of the data and to limit the chance of a conflict of interest. No participants in the study benefited financially, personally or professionally, or through cross-organizational role conflict. Each stage of ethical considerations is described here.

Before the study. Ethical issues have been addressed from the beginning of the study. The ethical issues that were considered before the study include the identification of a beneficial

topic and the identification of sampling sites respecting the culture and differences of diverse communities (Creswell, 2014). The first consideration focused on the selection of the research topic and the research questions explored. Creswell (2014) emphasized that ethical research begins with a beneficial research topic. This study looks to add to the current research on growth and failure mindsets to help educators and schools improve the culture of the learning environment to better support early adolescents. Chapter 2 explained the need for this study, which is examined through the lens of the conceptual framework. Providing honest, clear, and concise information about the study to schools, students, and families in the consent phase and explaining the importance of the possible findings and the power of including students' voice is of utmost importance.

The study includes schools across the chosen metropolitan area, representing a variety of different socioeconomic levels, races, cultures, and linguistic backgrounds. One ethical consideration is selecting sites that allows the researcher to respectfully collect data that can be used to generalize the findings without the teachers, students, and parents feeling like the vulnerabilities of their unique community are being taken advantage of (Creswell, 2014). It is important to find out about the cultural and linguistic characteristics of each site and ensure that the information about the study is provided to parents in their home language. This allows the researcher to clearly explain the importance of the findings and how participation is an opportunity to ensure their voice in the findings that will outline how schools can better meet the needs of early adolescents.

During the study. During the sampling process, the ethical issues relate to the concept of doing no harm (Fowler, 2014). In order to do no harm, the researcher focused on the procedures for acquiring consent, the sampling experience for students, and the steps necessary to ensure

confidentiality. When first working at each site, while explaining the purpose of the study and obtaining consent, information was provided to families and students in their home language. The consent process informed students and families that they may remove themselves from the study at any point in the process.

The sampling experience is the next area that this researcher examined through the lens of research ethics (Fowler, 2014). In order to sample the students in a way that did not create test anxiety, the sampling was done in a classroom with a science teacher they have worked with for the year. This relationship helps alleviate some of the stress of the survey and the nature of the questions. It is essential to recognize that students today undertake a greater amount of standardized testing than those in the past decades. To limit the effects of test fatigue, the survey was administered in science classrooms, as science is one subject area with limited testing requirements.

Steps were taken during the survey to ensure confidentiality. Any individual participating in a research study has the reasonable expectation that their privacy will be guaranteed (Creswell, 2014). The survey numbers issued at the time of the survey so that the identifying characteristics of the individual students are not associated with the survey responses. The demographic information of the students is stored in a locked closet in a location that does not store the survey data. Once analyzed, the raw data and all the research materials will be kept for a period of 3 years.

Analyzing the data. The ethical issues during the data analysis procedures that this researcher focused on center around the impact of bias and how to limit this impact (Hellerstein, 2008). The past experiences and assumptions of a researcher introduces the threat of bias into the data analysis process. This bias may result in misstatements and misinterpretations of the data

(document on desktop). To address the ethical issues that could arise due to researcher bias, this researcher includes writing activities in order to bring to the fore any bias that may impact the interpretation of data. The researcher also used the concept of corroborating evidence to analyze data. The corroborating evidence includes findings from research question 3 as well as evidence found in similar studies in the literature review.

Each step of the research process requires ethical consideration. This section outlined the aspects of a student that have been examined through the lens of research ethics and the steps taken to ensure that the students and their families are respected throughout the study. Ethical considerations were made during the development of the study and the sampling and throughout the analysis of data.

Chapter Summary

The stage–environment fit theory (Eccles et al., 1991) highlights the challenges students experience as they transition from elementary to middle school and how the context of the classroom may play a part in the academic decline that is typically observed in early adolescents (Eccles et al., 1993). The purpose of the study is to examine the impact of a student's growth mindset on their attitudes toward failure and challenges while examining the academic culture of the classroom that facilitates mindset development. The research design outlined in this chapter examines the impact on the growth and failure mindsets on a student's attitude toward challenge and the context of the classroom that facilitates mindset development. This mixed methods study examines the impact of interactions in the classroom through teacher feedback and the instructional practices that support a student's focus on learning and a view of failure as an enhancing experience.

The mixed methods design used for this study allows the researcher to gain an understanding of the culture of the classroom and its impact on student mindset (Creswell, 2014). This survey design gathers information from seventh graders in the first semester of their second year of middle school. The quantitative part of the study examines the connection between mindset, both growth and failure, and a student's attitude toward challenges. It also examines the impact of feedback, particularly strategy feedback, on a student's perception of the learning environment and their growth and failure mindsets in that context. The qualitative portion of the survey asks students to describe the instructional practices that help them work through a setback while maintaining a focus on learning (Creswell & Poth, 2018). The study includes the narrative of the students' lived experiences, which instructional practices facilitate the failure-is-enhancing mindset, and which aspects of the classroom culture are necessary for developing this mindset.

Focusing on the conceptual framework and the struggles early adolescents experience during the transition to the middle school, this study aims to identify the interactions and instructional practices that help develop growth mindset and improve the culture of the classroom for students in this developmental stage. Aiming to enhance the experience of learning for future students, this researcher set out to do no harm to those participating in the survey. The following ethical issues were considered here: (a) identification of a beneficial topic, (b) identification of sampling sites that represent a diverse community, (c) the procedures to provide information about the study, and (d) obtaining consent that respects the cultural and linguistic differences of those communities. The data analysis procedures identify the impact of bias and how this impact can be limited (Creswell, 2014).

The next chapter provides a description of the findings uncovered by the study. It includes a detailed description of the sample as well as the research methodology and analysis

used to make meaning of the data collected. The data of the quantitative and qualitative portions of this study will be presented, and the results described allows the researcher to summarize the findings of the study.

Chapter 4: Data Analysis and Results

Introduction

Recognizing the critical transition from elementary to middle school (Ellerbrock & Kiefer, 2013), this researcher set out to identify the instructional practices that help develop growth mindset in early adolescents. This study aimed to examine the ecological factors of the classroom learning environment to gain an understanding of the interactions and instructional practices that help students develop the failure-is-enhancing mindset. This mindset is demonstrated by a student who recognizes that failure promotes learning, performance, and growth (Haimovitz & Dweck, 2017). The research design was a mixed methods study that included a survey that asked students to score responses on a Likert scale as well as a series of open-ended questions in individual student interviews.

The purpose of this mixed methods study was to examine if there was a correlation between mindset and a student's attitude toward challenges within the context of the classroom. The quantitative portion of the study aimed to determine the influence of growth and failure mindset on a student's attitude toward challenges and explore how feedback within that context would influence mindset development. The qualitative portion of the study incorporated student voice on the teacher instruction, interactions, and feedback that contribute to mindset development.

Data collection was done in Fall 2019. First, the survey used in this study gathered information about students' growth and failure mindsets and attitudes toward challenges and how feedback influenced these mindsets. The survey instrument was compiled by this researcher and included the Theories of Intelligence scale (Dweck, 1999), the Failure Mindset scale (Haimovitz & Dweck, 2016), the Grit-S (Duckworth & Quinn, 2009), and the PEET scale (Rattan et al.,

2012), along with modified items from the Theory of Intelligence scale and Failure Mindset scale that address student perception in the context of a given scenario. Second, the interview questions allowed students to identify and describe the feedback, learning experiences, and classroom interactions that have allowed them to see the value of setbacks in the learning process. The data from this study was gathered from seventh graders, as they would have a year of middle school experience to reflect on. The interview gathered the students' holistic view of their learning environment and their insight into the experiences that helped them embrace challenges and persist through setbacks.

This chapter includes a review of the research questions and hypotheses, description of the sample, research methodology and analysis, review of the findings, and a detailed analysis and summary of the study.

Research Questions and Hypotheses

Research question 1. Is there a relationship between middle school students' growth mindset and their attitude toward challenges?

$\boldsymbol{H_{O1}}$**.** There is no relationship between middle school students' growth mindset and their attitude toward challenges.

$\boldsymbol{H_{A1}}$**.** There is a positive relationship between middle school students' growth mindset and their attitude toward challenges.

Research question 2. Is there a relationship between middle school students' failure mindset and their attitudes toward challenges?

$\boldsymbol{H_{O2}}$**.** There is no relationship between middle school students' failure mindset and their attitude toward challenges.

***H_{A2}*.** There is a positive relationship between middle school students' failure mindset and their attitude toward challenges.

Research question 3. Do the strategy messages received by middle school students during a setback impact the focus of learning?

***H_{O3}*.** The strategy messages received by middle school students during a setback do not impact the focus of learning.

***H_{A3}*.** The strategy messages received by middle school students during a setback impact the focus of learning.

Research question 4. How do instructional practices influence and promote the failure-is-enhancing mindset in students?

a. Based on students' lived experiences, which instructional practices facilitate the failure-is-enhancing mindset?

b. What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

Description of the Sample

This researcher set out to examine the instructional practices and the feedback students receive in the classroom that influence their mindset development. The sample for this study comprises of middle school students in the metropolitan area of a large city in the Pacific Northwest of the United States. This researcher defined the target population for this study as the seventh graders across the survey area. Seventh grade was selected because the students would have one full year of middle school education and experiences.

After receiving IRB and district approval, this researcher reached out to the principals of three middle schools in a single school district. Each of these schools represents a different

socioeconomic level, as measured by the percentage of students on free and reduced lunch as well as racial demographics (Dillman et al., 2014). These schools were selected on the basis of the free and reduced lunch levels—one with a low percentage of students on free or reduced lunch (10%–30%), one with students on a high rate of free or reduced lunch (60%–95%), and one with an average percentage of students on free or reduced lunch (31%–59%).

School A reported that 18% of the students received free and reduced lunch, while School B and School C reported 57% and greater than 95%, respectively. Table 9 outlines the demographic breakdown for each of the three sites. Beyond the selection of schools from the free and reduced lunch categories, this researcher selected schools across the city, including the racial, cultural, and linguistic diversity of the metropolitan area.

Table 9

Sample Population

School	population	#7th Graders	F/R %	Asian %	Black %	Hispanic %	Multiracial %	Pac. Is.	White %
A	Total	724	18	7	2	11	18	1	62
	7th grade	273	15	5	1	10	19	-	64
B	Total	432	57	1	38	16	14	<1	30
	7th grade	165	58	1	38	21	13	1	27
C	Total	443	>95	4	22	40	10	2	20
	7th grade	156	72	5	21	41	8	1	2
Total 7th grade		594							

Note. F/R = percentage of students on free and reduced lunch.

After conversations with the school staff about predicted return rates, three seventh-grade science or STEM classes were selected from each site. From these classes, 51 surveys were completed at School, 29 at School B, and School C completed 14 surveys. The total sample size was 94. An Assistant Principal facilitated the survey protocol at school B due to staffing issues.

This decision was made with the goal of creating a safe and comfortable survey environment for the students.

For the qualitative portion of the study, five students were interviewed by this researcher at each school site; the sample included seven boys and eight girls. To the best of the researcher's abilities, the students who participated in the interviews and those who completed the surveys represent the cultural, socioeconomic, and linguistic diversity of the district (see Table 10). The wide diversity of classroom experiences that each of the participants had added to the inclusive nature of this study, increasing the researcher's ability to capture the voice and thoughts of students who have been historically underserved.

Table 10

Interview Sample

School	sample	Asian	Black	Hispanic	Multiracial	Pac. Is.	White
A	5	2	-	-	1	-	2
B	5	-	2	-	1	-	2
C	5		2	1	1		1
Total	15	2	4	1	3	-	5

Research Methodology and Analysis

Quantitative data analysis. The survey data for this study was compiled in an Excel spreadsheet using an identification code to identify the school and survey type along with the student survey number. For instance, CB11 indicates school C, survey form B, and student number 11. Each survey item was measured on a 6-point Likert scale, where 1 indicated that the student strongly agreed with the statement and 6 represented strong disagreement. Reverse coding was used to create a composite score; a high number represented growth mindset, failure-is-enhancing mindset, a positive attitude toward challenges, and both growth and failure-is-enhancing mindsets within the context of the science classroom (Haimovitz & Dweck, 2016).

Once entered and reviewed, Items 1, 2, and 3 for the Growth Mindset scale, 10, 11, and 12 for the Failure Mindset scale, 13, 14, 15, 17, and 19 for the Grit-S, 22, 23, 24, and 25 for the PEET scale. Items 27, 28, 33, and 34, for the growth and fixed mindset in context, were reverse coded. This data was then used for an Exploratory Factor Analysis and the Pearson's *r* correlation and ANOVA testing.

Exploratory factor analysis. An exploratory factor analysis was used due to a large number of constructs included in the survey tool. This analysis allows the researcher to examine the relationships and correlations between the survey items (Yong & Pearce, 2013) that are interval in nature (Hooper, 2012). The factor analysis is used in the validity testing of scale data by the following steps: (a) determining how many factors underlie a set of constructs, (b) determining which constructs form under which factor, (c) identifying correlations, and (d) calculating what proportion of variance in the construct is accounted for by the factors (Dimitrov, 2011). The literature recommends a sample size of at least 300 (Yong & Pearce, 2013; Williams et al., 2012). The exploratory factor analysis was done with a sample size of 94. This researcher proceeded with the principal component analysis to determine the adequacy of the sample.

Factor analysis is often used in studies in the field of education as a method of interpreting self-report survey tools (Williams et al., 2012). First, a principal component analysis (PCA) was run in SPSS. The principal component analysis was used to allow the researcher to analyze the internal structure of the instrument used in this study (Zabaleta-del-Olmo, 2016). The goal of the PCA is to identify the components in a survey tool (Kuusisto, Laine, & Tirri, 2017; Williams et al., 2012). The first data examined in the PCA is the Kaiser–Meyer–Olkin (KMO) measure and Bartlett's Test of Sphericity. The resulting analysis showed a KMO measure of

0.684. The KMO is a measure of sample adequacy (Williams et al., 2012). Since the measure is greater than 0.5, the sample size of 94 is adequate. The Bartlett's Test of Sphericity indicated that it was significant and showed at least one correlation between two of the items.

The next step of the PCA was to examine the eigenvalues and identify the number of components to be extracted. The researcher started with Kaiser's criteria, which suggests retaining components with eigenvalues greater than 1.0 (Young & Pearce, 2013). Eigenvalues are the measurement of the variance that each component accounts for (Buchanan, Valentine, & Schulenberg, 2014). The PCA resulted in 10 components with eigenvalues greater than 1.0. This was also the case with the scree plot. A parallel analysis was used to better identify the number of components to be included in the component analysis. The comparison of the mean eigenvalues in the parallel analysis and the eigenvalues in the PCA led the researcher to identify five components (Williams et al., 2012). These five components together account for 55% of the cumulative variance. The scree plot (see Appendix E) graphically highlights the eigenvalues in descending value (Hooper, 2012). The point of inflection occurs between components 5 and 6. Taken along with the parallel analysis, the scree plot supports the inclusion of five components in this exploratory factor analysis.

Using SPSS, a component analysis was run with varimax as the rotational method. This step allows the researcher to determine if a variable relates to more than one component (Williams et al., 2012). Varimax is an orthogonal rotation that provides the researcher with the ability to examine component loadings within the context of correlations between common components (Fabrigar & Wegener, 2011). The rotated component matrix outlined which components each survey item loaded under. As depicted in Table 11, component 1 included items 1, 2, 3, 11, 12, 17, 22, 23, 24, 25, 27, 33, and 34; component 2 included items 7, 8, 9, 30,

31, and 32; component 3 included items 4, 5, 6, and 26; component 4 included 16, 18, 20, and 21; component 5 included items 13, 15, and 19, 28, and 29. Items 2, 3, and 29 were double-loaded and, therefore, were removed (Williams et al., 2012). Items 10 and 14 did not load in any factor and were discarded.

Table 11

Components with Observed Variables

Observed Variable	Factor loading	Commonality	Derived variable	Variance (%)	Reliability coefficient
Component 1					
PEET_1	.830	.664			
PEET_2	.800	.601	PEET	21.092	0.897
PEET_3	.783	.861			
PEET_4	.722	.817			
PEET_5	.698	.705			
PEET_6	.661	.838			
PEET_7	.660	.572			
PEET_8	.656	.525			
PEET_9	.650	.703			
PEET_10	.607	.586			
PEET_11	.471	.797			
Component 2					
FAILURE_1	.796	.792			
FAILURE_2	.760	.631	Failure	14.469	0.841
FAILURE_3	.755	.709			
FAILURE_4	.748	.808			
FAILURE_5	.688	.728			
FAILURE_6	.626	.673			
Component 3					
GROWTH_1	.808	.768			
GROWTH_2	.683	.791	Growth	7.752	0.771
GROWTH_3	.646	.844			
GROWTH_4	.622	.636			
Component 4					
GRIT_1	.735	.785			
GRIT_2	.662	.848	Grit	6.592	0.697

(continued)

Observed Variable	Factor loading	Commonality	Derived variable	Variance (%)	Reliability coefficient
GRIT_3	.645	.786			
GRIT_4	.586	.671			
Component 5					
FOCUS_1	.630	.804			
FOCUS_2	.556	.361	Focus	5.744	0.519
FOCUS_3	.533	.774			
FOCUS_4	.484	.748			
FOCUS_5	.409	.684			

Reliability tests were run for each component using SPSS. Cronbach's alpha is a measure of internal consistency and how closely related the set of items are as a group (de Vet, Mokkink, Mosmuller, & Terwee, 2017). The results showed that component 1, with 11 items, had a Cronbach's Alpha of 0.897, component 2 had 0.841 with six items, component 3 had 0.771 with four items, component 4 had 0.697 with four items, and component 5 had 0.519 with five items.

Quantitative Data: Summary and Analysis of Results

The first research question examined if there was a relationship between middle school students' growth mindset and their attitude toward challenges. The data analysis revealed that there was no correlation between a student's growth mindset and attitude toward challenges. This analysis failed to reject the null hypothesis that stated that there is no relationship between middle school students' growth mindset and their attitudes toward challenges. Since the null hypothesis was not rejected, there is a potential for a Type II error. The participating schools were representative of the overall community but also had unique characteristics. School A included a Dual Language Immersion track, School B had been open for just over a year after a redesign, and School C was a Title I school with extra programs that extended the learning day. These factors could have influenced the data outcomes. These results should be seen through the context of the schools, which may have been the reason for the negatively skewed distribution.

The second research question looked for a correlation between failure mindset and a student's attitude toward challenges. A Pearson's *r* correlation was used to determine if there is a relationship between middle school students' failure mindset and their attitude toward challenges. The data analysis revealed that there was no relationship between middle school students' failure mindset and their attitude toward challenges. The null hypothesis was retained. As this researcher was unable to reject the null hypothesis, there is potential for a Type II error. The potential sources of these errors could be the context of the school environment, as described in the previous paragraph. Another source of error could be the student's understanding of and experience with failure in the learning process. As will be discussed later in this chapter, students expressed the knowledge that failure was part of the learning process but had little experience using it as a tool to overcome obstacles. This lack of experiences may have influenced the self-reported responses, leading to a Type II error.

Research question 3 was designed to explore the impact of different feedback messages on a middle school student's focus on learning. The research design utilized three different feedback types: strategy, comfort, and control. After the component analysis and the analysis of the data, this researcher identified an error in the survey tool that would impact student ability to interpret the feedback type. The error made it impossible to interpret the data accurately. As a result, RQ3 will not be analyzed beyond this point.

Detailed Analysis

The survey data was gathered and compiled into an Excel spreadsheet manually. The data was cleaned to detect the statistical outliers and ensure data quality (Hellerstein, 2008). This researcher first examined each variable included in the sample. The steps outlined by Hellerstein (2008) begin with examining each column individually to identify the data points that deviate

from what is expected based on the rest of the data collected. The next step involves the calculation and analysis of descriptive statistics. This researcher calculated descriptive statistics that included mean, minimum value, maximum value, standard deviations, and variance (see Table 12). These statistics were used to obtain an objective view of the data. Outliers were identified as the scores falling outside of two standard deviations from the mean. The outliers were removed from the data set; this included three data points in the growth mindset variable, two in the failure mindset variable, and six in the attitude toward challenges variable.

Table 12

Descriptive Statistics

Variable	Mean	Min	Max	Std. Dev.	Variance
Growth Mindset	4.84	2.25	6.00	0.83697	0.701
Failure Mindset	4.33	2.40	5.80	0.71384	0.510
Attitude toward Challenges	3.63	2.00	5.25	0.61429	0.377

Student scores for three variables—growth mindset, failure mindset, and willingness to embrace challenges—were then uploaded into SPSS. Prior to calculating the Pearson's r correlation, the data was analyzed to test the following assumptions: (a) the variables are continuous, (b) there is a linear relationship, (c) the variables are normally distributed, and (d) there are no outliers (Ayiro, 2012). Scatterplots were used to test for linearity and a boxplot to identify the outliers; a Shapiro–Wilk test provided a test of normality.

The scatterplot for growth mindset and attitude toward challenges (see appendix G) shows a linear relationship, with a positive relationship between the two variables. This researcher was unable to discern a statistically significant relationship between failure mindset and attitude toward challenges using the scatterplot. Boxplots were used to identify the outliers in each of the variables. The corresponding graphs showed only one outlier, which was found in

the data measuring a student's attitude toward challenges. When this data point was compared to the participant's mean responses for growth and failure mindsets, it appeared consistent with the other scores and, therefore, was characterized as a mild outlier (Birkett, 2019).

The Shapiro–Wilk test was run to test for normality. Table 13 depicts the results of the Shapiro–Wilk test for RQ1 and RQ2. Working with an alpha of 0.05, a result of less than 0.05 would indicate that the data is statistically different from a normal distribution, while a result higher than 0.05 would indicate normal distribution. The results outlined in Table 13 illustrate that growth mindset failed to have a normal distribution, while attitude toward challenges, with an alpha of 0.249, demonstrated normal distribution. For RQ2, both failure mindset and attitude toward challenges had results above 0.5 and, thus, demonstrated normal distribution.

Table 13

Tests of Normality

	Shapiro–Wilk		
	Statistic	*df*	Sig.
Growth Mindset	.946	85	.001
Attitude toward Challenges	.981	85	.249
Failure Mindset	.978	86	.152
Attitude toward Challenges	.981	86	.243

Data on the construct of growth mindset was analyzed for kurtosis and skewness to determine if the results were statistically significant or a violation of the assumption (Bacon, 2012). Kurtosis provides information about the weight of data and the distribution relative to the standard deviation. SPSS was used to calculate kurtosis, with a kurtosis value higher than +/- 1.96. The kurtosis analysis resulted in a value of -1.692, which indicates that the results are not statistically significant and may not violate the assumption.

A distribution is described as normal if there is a high probability that a data point will be close to the average. Skewness examines the impact of extreme scores (Bacon, 2012), and this was analyzed using SPSS. The resulting histogram highlighted extreme scores with values of 5 and 6; the data is negatively skewed (see Figure 3). The skewness was divided by the standard deviation of skewness for a value of -0.74. This value is less than +/- 1.96 with a $p < .05$, indicating that the results are not statistically significant. The analysis of kurtosis and skewness led this researcher to proceed with the Pearson's *r* statistical test.

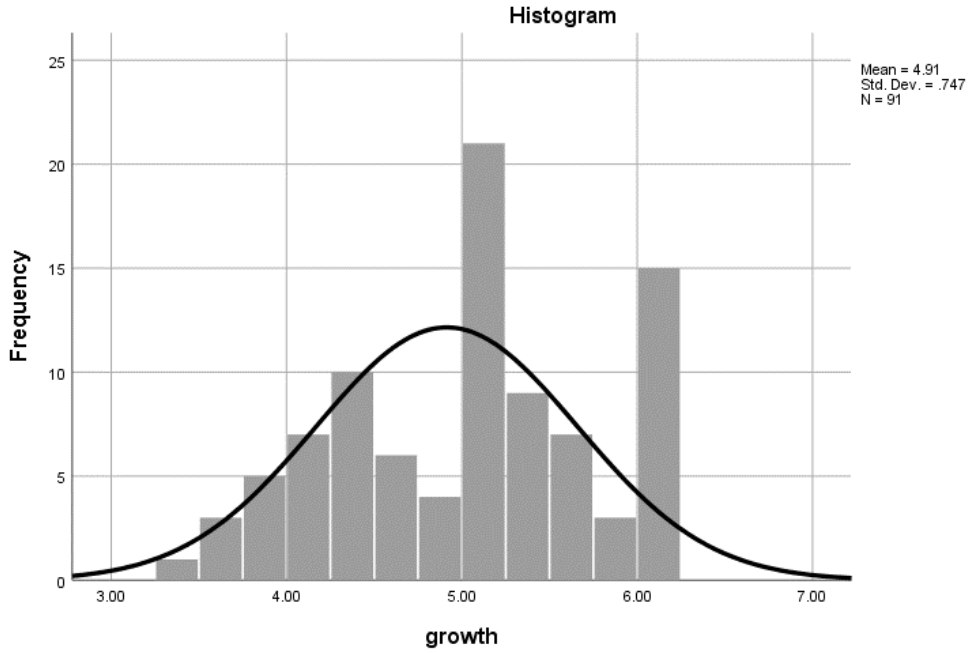

Figure 3. Distribution of Growth Mindset.

A Pearson's *r* statistical test was used to investigate the relationship between two variables (Ayiro, 2012). A Pearson's *r* correlation was used to determine if there was a correlation between the variables in RQ1 and RQ2, because the two variables were measured at the interval level. RQ1 sought to determine if there was a correlation between growth mindset and a student's willingness to embrace challenges. The data was analyzed through a bivariate correlation to create a scatterplot and calculate *r* in order to determine the potential presence and

strength of a correlation. The data, depicted in Table 14, resulted in a Pearson's correlation of 0.207, which does not represent a correlation between these variables.

Table 14

Correlations

		Growth Mindset	Attitude toward Challenges
Growth Mindset	Pearson Correlation	1	.207
	Sig. (2-tailed)		.058
	N	91	85
Attitude toward Challenges	Pearson Correlation	.207	1
	Sig. (2-tailed)	.058	
	N	85	88

Research question 2 examined the correlation between failure mindset and a student's willingness to embrace challenges. The Pearson's correlation for RQ2, outlined in Table 15, was 0.018. This result showed an absence of correlation between failure mindset and a student's attitude toward challenges.

Table 15

Correlations

		Failure Mindset	Attitude Toward Challenge
Failure Mindset	Pearson correlation	1	.018
	Sig. (2-tailed)		.868
	N	92	86
Attitude toward Challenges	Pearson Correlation	.0.18	1
	Sig. (2-tailed)	.868	
	N	86	88
Control	34 4.38	3.04 5.50	0.674 0.454

The data analysis outlined here describes the steps this researcher took to gather and clean data. Descriptive statistics were analyzed to identify the outliers before testing the

following assumptions: (a) the variables are continuous, (b) there is a linear relationship,(c) the variables are normally distributed, and (d) there are no outliers (Ayiro, 2012). Further analyses of kurtosis and skewness were run on the variable growth mindset; the results were not statistically significant. Pearson's *r* correlations were run on both growth mindset and failure mindset with a student's attitude toward challenges. The results indicate a lack of correlation between growth mindset and failure mindset in relation to a student's attitude toward challenges.

Qualitative Data: Summary and Analysis of Results

Qualitative data analysis. In the qualitative portion of this study, seventh graders were asked a series of open-ended questions by the researcher during individual student interviews. Through this, the researcher gathered student voice and perspectives on their classroom environment, interactions within the classroom, and instruction and feedback as it applies to academic challenges. The data was analyzed to allow the researcher to identify trends. A transformative framework was used to gather perceptions of students, and these were used to understand how educators may better serve early adolescent learners in middle schools.

The validity and reliability strategies in the data analysis included clarifying research bias, corroborating evidence through multiple data sources, and multiple levels of member checking (Creswell & Poth, 2018). Five students from each study site participated in the interviews for a total sample of 15 students (Daniel, 2012). During each of these interviews, the researcher took extensive notes as the students shared their thoughts and opinions. For member checking, those notes were reviewed with students to ensure accuracy and gain clarification if needed. The researcher chose to use the notes for member checking rather than the transcripts as they could be done during the same visit. While working on scheduling the interviews, there were changes of principals and teachers and those gone for long amounts of time. In Chapter 3,

one of the ethical issues to be considered was the practice of doing no harm. Instability at several of the test sites led this researcher to draw the conclusion that pulling students out of class one more time would result in a diversion from their education.

The interviews were transcribed by hand, reviewed, and then typed into Microsoft Word. The files were then uploaded into NVivo 12. Before the data analysis and the reading and note-taking stage, this researcher engaged in a journaling activity to identify their biases from professional experience. Each interview was read individually to pull out key phrases and concepts, and student perceptions of what worked well and what was missing were included in the analysis. After this, the researcher referred to the interview notes to ensure that the margin notes created during this process did not contradict the thoughts the students had confirmed after the interview. After this was done for each interview, this researcher examined the data set to find common themes. These themes were used to develop codes. Six codes were created for the first round: interactions with teachers, interactions with peers, instructional practices, evaluation, classroom culture, and missing (Creswell & Poth, 2018).

Using NVivo 12, each interview was reviewed, and the keywords, phrases, and answers were coded into the six categories. After this initial process, the frequency of codes were as follows: (a) teacher interactions 61, (b) instructional practices 49, (c) evaluation 40, (d) missing 30 (e) interactions with peers 23, and (f) classroom culture 15. The data in each of these codes was re-examined to identify the subcategories that could be used to better understand and describe student experience and ensure that their voice was accurately represented. During this second coding activity, it became clear that the missing category could be better used as a subcategory in four of the remaining five categories (see Figure 4).

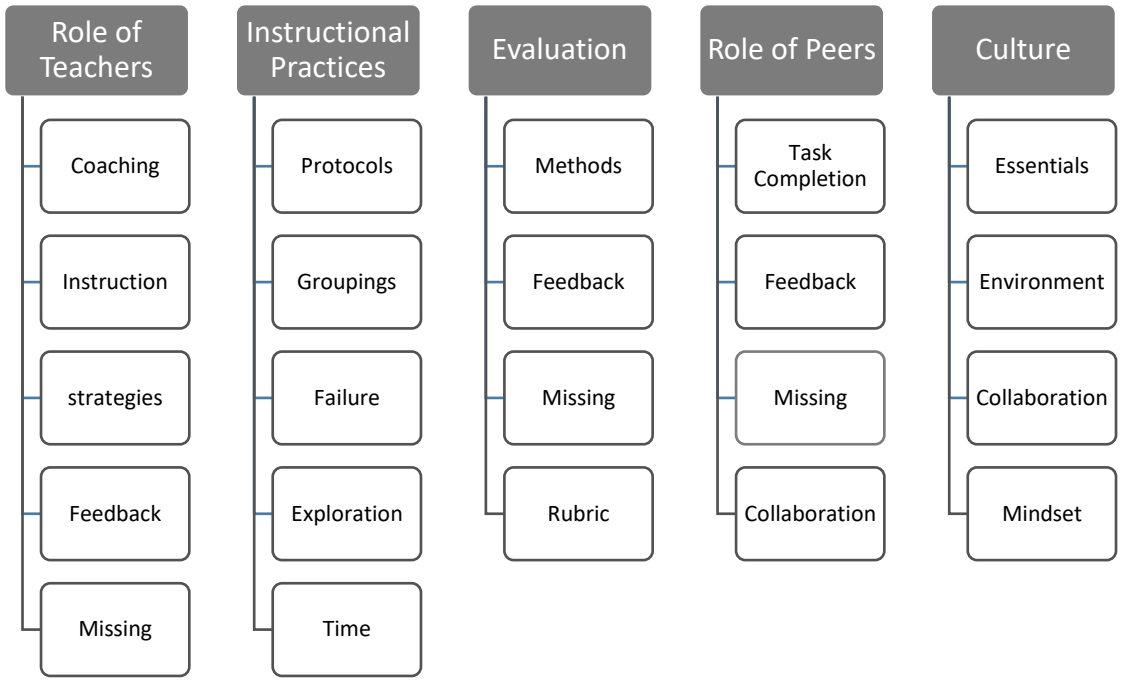

Figure 4. The code and subcode hierarchy.

After this initial coding process, an independent auditor was brought in to examine the interviews and the coding structure for a second layer of member checking. This auditor was a professional educator with no link to this study. This step of the analysis process was taken to preserve the context of the data. The auditor first sampled the interview transcripts, randomly selecting three interviews to listen to while checking the accuracy of the transcription (Ivey, 2012). Since the student member checking was also included in the audio, the auditor was able to check the accuracy of the notes and that process as well. The auditor then reviewed the interviews and the codebook. The auditing process did not result in changes to the coding in this study.

Summary of Results

The interviews conducted for this study illustrate the presence and role of failure in middle school classrooms. Five of the 15 participants believed in the role and value of mistakes as part of the learning process. These responses were recorded across the school sites and

varying socioeconomic levels. These comments are best represented by a seventh grader at school site C, a school with over 95% students on free or reduced lunch rate. When asked about the classroom activities that helped students take ownership of learning, the student responded, "There's a little bit of failure. So, like if they were to leave me alone and not explain anything. I would most likely ask for help or guess. And I would probably get some of that wrong." When asked whether failure influences the predicted outcomes, the student stated, "No, I think everybody has some of that and I can learn from them." One student from School A stressed on the emphasis of grades in our educational system. "Well I think there is too much emphasis on grades personally, and I think a lot of students feel that way. I mean my parents don't pressure me to get good grades, but I still feel pressure." The student then linked teacher practices to shifting the stress from grades to learning, "If teachers were not really stressing grades at all but giving you something to work out. And if you don't do it the first time, they would give you more chances, and that means you're like learning from your mistakes."

The insights and narratives from the interviewees shed light on the interactions and practices that helped students see failure as part of the learning process. Teacher messages were included in these comments. Interviewee A-2 stressed on the power of these messages, "Just saying mistakes are okay and they are not bad, making them more positive and giving us a chance to use our knowledge but if we get it wrong then letting us correct it." Students at two of the school sites pointed to the instructional practices that build over time for experimentation, mistakes, reflection, and learning. One student at School B described the benefits:

> When we do experiments in science or just like stuff with tiles in math, that really helps because, especially when you have a nice timeline, then you can know okay I might get

this on the first try but probably not. Then you can be comfortable with that and not be like, “Oh my goodness, no, I can’t get this wrong, now I have to get this right.”

Two students commented on the benefits of multiple trials and “having the time to look at the different sides of the problem or question.”

Despite the comments made by these students about failure and the role it plays in learning, 60% of the participants were unable to identify a time when feedback helped them overcome an obstacle. This percentage increased to 73% when responses that were merely coaching and pep talks, rather than content and skill-based feedback, were included. This led this researcher to explore the source and role of the feedback students were receiving and how it was utilized in order to examine the ecological factors that led to the failure-is-enhancing mindset.

Of the 15 interviewees, 14 were able to identify a time that a teacher had helped them overcome an obstacle. For six students, the feedback was described as redefining expectations and finding a new way to explain the content. For two students, from School C, the feedback helped them jumpstart their thinking:

> They ask you, “Hey what are you stuck on?” and for whatever I’m stuck on, they’ll be like “Hey you could think about this”—they don’t tell me the answers, they just tell me how to get ideas, because that’s my thing with writing. It’s hard to get ideas to keep going.

One student talked about collaboration, “He works on it with us. Kind of talks you through the problem,” and being friendly and available for questions, “Usually just being available as much as they can. I know it’s like, its hard with like 25 kids in each class. Just being able to move on and answer as many questions as possible . . . um . . . and being supportive, not being too strict.” Only one student was unable to identify helpful interactions with her middle

school teachers, “I feel like they don’t really do that. They are just kind of ‘You got this, keep going,’ but it doesn’t really work. Just saying that sometimes they explain how to move on, but it doesn’t really work.’”

The sentiments students shared about feedback were more common when they discussed the feedback they received from peers and their opportunities to evaluate their own learning. Only three of the 15 students were able to identify a time or activity that allowed them to obtain effective feedback from their peers that could be used to further their learning. For these students, it was a culture of collaboration, as described by a female student from School B, “Yes. In [teacher’s name] class, yes. One of the rules is to help your peers when they are struggling. But not in any other class.” Feedback was sometimes facilitated through the learning activities teachers arranged:

> Well, sometimes the teachers do set that up actually. Like sometimes, we have an essay, and then it takes another student to do because the teacher can be distracted or whatnot. But the students can look at your work and find things that you’ve missed. That usually works out pretty well. And then like especially with group projects and you are kind of lost, a student can be like well that’s really good, and you can also add this and this. And yeah, it’s pretty good.

Seven of the remaining 12 students mentioned only peer editing, while five students, from two of the three schools, could not recognize a time they had received feedback from peers.

When asked how teachers help them evaluate their own learning, six of the 15 students responded that this did not occur. Two students described the grade they received or a comment such as “Great job;” two discussed their notebooks, which are then used on tests, and four

students discussed reviewing answers after the assignment or test was graded. One factor that stood out for this researcher is that all these instances occurred after the learning process.

Although the students described the role failure played in learning, the interviews showed that they predominantly depended on the teacher for feedback, and this feedback often came after the learning process as a summative grade or a comment on a test. When viewing these highlights and the other comments of students through the lens of the Stage–Environment Fit theory, several themes arose, highlighting missed opportunities, instructional practices that promote reflection, and collaboration and systematic changes that could help students focus on learning.

The interviews highlighted that middle school students understand that mistakes and setbacks are a part of learning and that very few students had experiences in the classroom that helped them learn from those mistakes and, as a result, become stronger learners. Common themes appeared through the NVivo analysis of the coding hierarchy. The themes that arose through the analysis of the interviews are as follows: (a) classroom instruction that embraces exploration and failure, (b) quality of feedback, (c) evaluation and grading practices, and (d) time.

Classroom instruction that embrace exploration and failure. The classroom activities and instructional strategies that 13 of 15 students described featured a teacher-centric model of education where "mainly the teacher takes control." This was described by one student from School A:

> In science, if there is a lab, you are working with a group and like the teacher isn't telling you exactly what to do. You can kind of decide what you want to do. And . . . I don't

know. . . . Usually, we don't. Often, it's the teacher lecturing you in class. Cuz that's how they were trained to teach you, cuz like the system.

According to one of the students from School C, "The teachers . . . sometimes they'll talk and then they'll write. And they'll have us copy down some stuff and then say some stuff in our own words." Independent of the socioeconomic level, students from each school described learning, in most classrooms, as directed solely by the teacher.

Contrary to the description of the conventional classroom setting, the students were able to identify and describe the learning experiences that allowed them to learn from mistakes and eventually overcome misconceptions. A student from School B described the impact that hands-on exploratory activities had on her mindset:

> We do experiments in science or just like stuff with tiles in math; that really helps because, especially when you have a nice timeline, then you can know, "Okay, I might get this on the first try but probably not, but it's okay."

One-third of the students interviewed highlighted that these activities increased interest, allowed them to make learning their own, and gave them the chance to try something repeatedly. The sentiments of the interviewees when they were in charge of their own learning were voiced by a Hispanic male at a school with over 95% of students on free and reduced lunch, "There's a little bit of failure." The power of these opportunities was explained by a white female student from School A, "I think hands-on stuff because you can try it multiple times. And if you don't do it the first time, they give you more chances, and that means you're like learning from your mistakes."

Quality of feedback. The responses about feedback indicated that for students, feedback meant grades. The responses referenced the letter or comment at the top of tests. For most, this

feedback came at the end of the unit after the grade had been assigned. As a student at School A stated, “They write comments, and that’s it. If they write them well, it does help you reflect on it.” A student from School B described these interactions:

> But they are coming to me with feedback, they are going to come and say I was looking for you to do it this way. You did a great job, just go and change a few things. And they’ll tell me what I need to change.

Feedback from teachers was a recurrent theme throughout the interviews. While three students pointed to group activities and projects as times when they received feedback from classmates, other opportunities were limited to editing the writing and checking answers. There was little evidence of students taking time to reflect on their learning, facing obstacles, and looking for strategies to overcome them. Five students mentioned the use of rubrics for clarity on assignments or projects. However, similar to other feedback, the students mentioned rubrics coming in at the end of the learning experience. Other times, students talked about the amount of information included in the rubrics, the stress and anxiety this caused, and the steps teachers took to relieve that stress. A student from School C described their experience with rubrics:

> So, in the five-paragraph essay and it was like this long, and it had a lot of stuff. And I was like this is one, I can’t do that. This is two, I can’t do that, three maybe, and four I'm aiming for that. But there were a lot of things.

When asked to think of a time when rubrics were helpful, the student responded, “They [teacher] said just don’t focus on this right now and do this. This is more important than that.”

Evaluation and grading practices. During interviews at School B, several of the students mentioned re-testing as an opportunity to learn from mistakes and improve grades. The decrease in anxiety around testing was described by student B3, “It really reduces the stress of

tests because it's like if you don't get a good grade, just practice that stuff and retake it. And so that really helps." School B reopened as a middle school during the previous school year. As this researcher was talking to students, the initial presumption was that the results were due to some of the work being done at the building level when they re-opened. The sentiments around grading, evaluating, and re-testing were repeated at the other two schools as well:

> Yes, it really helped me, so I went in at recess a couple of times, and I looked in the text and was like "Oh," and, of course, you can't use the textbook when you're actually taking the test but it helped.

Beyond retesting, students pointed out different grading systems. The Dual Language Immersion program at School A used the "effort system." In this system, "depending on how much effort you put into it, you get a grade." This recognition of the effort it took to become fluent in a second language influenced student attitude, "[it's] nice because it's not focused on what you got wrong, it's how well you did." Other systems focused on the effort during those formative assignments, "The way he grades I like the most. He like grades in the way if you turn it in and worked hard, even if you didn't get them all right . . . unless it's a quiz, you get full credit."

Time. A student from School B empathized with his science teacher:

> Sometimes he gets frustrated like he only has forty minutes to teach a class and sometimes he can't get through the whole entire lesson. It takes sometimes two days so we're behind on stuff. I just hope we could give him a longer schedule or something.

While teachers and schools feel the crunch of time, each of the instructional activities that the students described as helpful required time. Time provided students the opportunity to take on challenges. "I just like some time to sit down with that information. Try to figure it out on my

own," stated one student. Then, if not finished, students mentioned that teachers provide the opportunity to complete it at home or provide more time in class. The benefit of time was highlighted by a student from School B:

> And sometimes it's just like you have to have another minute or two, on an extra day of just free work time for that assignment is sometimes really nice. But I don't know, for me, I just have to get through it, you know, slow and steady.

Summary

The purpose of this study is to examine the impact of a student's growth mindset and their attitudes toward failure and challenges while examining the academic culture of the classroom that facilitates mindset development. A mixed methods research design was used to allow the researcher to gain an understanding of the culture of the classroom and their impact on mindset (Creswell, 2014). Surveys were administered to 94 seventh graders from three different middle schools in the survey area. The survey gathered information on growth mindset, failure mindset, and a student's attitude toward challenges. The survey also examined the impact of feedback, particularly strategy feedback, on a student's perception of the learning environment as well as the learner's growth and failure mindsets in that context. After the survey, this researcher interviewed five students at each site. The questions in the qualitative part of the study asked students to describe the instructional practices and classroom procedures that helped them work through setbacks while maintaining a focus on learning (Creswell & Poth, 2018).

This chapter provided the results and data analysis from the quantitative and qualitative portions of the study. The data analysis and results for RQ1 and RQ2 revealed a lack of correlation between growth and failure mindsets in their relation to a student's attitude toward challenges. Research question 3 compared students' responses to feedback using comfort,

strategy, and control feedback. An ANOVA was used to compare the means of the responses to each type of feedback (Rutherford, 2011). The data analysis resulted in a lack of statistically significant differences in the means of the response to feedback.

The qualitative portion of the study involved interviews with 15 seventh graders (five from each school and socioeconomic level). The questions elicited information about the instructional strategies, feedback, and interactions that led to mindset development. The analysis of data highlighted the fact that one-third of the students could verbalize the role of failure in the learning process. Despite this mindset, 60% of the students were not able to identify a time that feedback had helped them overcome an obstacle. The analysis of the interviews helped this researcher identify some common themes: (a) classroom instruction that embraces exploration and failure, (b) quality of feedback, (c) evaluation and grading practices, (d) time.

The next chapter will provide a summary of the findings of this study as well as a discussion of these results and how they relate to the current literature. It will include the implications of the results for policy and practice in middle school education, along with recommendations for further research.

Chapter 5: Discussion and Conclusion

Introduction

This chapter reviews the current study, including the research questions, the review of literature, results, links to the current literature, and the implications of the findings for practices in middle school settings. This mixed methods study explored the relationship between the growth and failure mindsets and a student's attitude toward challenges while examining the ecological factors in a classroom that lead to mindset development. A qualitative portion gathered student insight on the instructions, interactions, and feedback given in classrooms that allowed them to see failure as a positive step in the learning process. This chapter synthesizes the findings for each of the research questions.

In this chapter, this researcher offers an interpretation of the results, describing the sources of possible bias and trends that arose from the interviews in the qualitative portion of the study. Along with a description of these findings, the researcher will attempt to explain how these results relate to relevant research. The analysis uncovered the practical implications of this study as it relates to middle school education.

Summary of Results

The transition from elementary to middle school is critical in the development of early adolescent learners (Ellerbrock & Kiefer, 2013). The ecological factors in middle school classrooms, such as larger school size, higher grading standards, ability grouping, lower autonomy, and less contact time with teachers, impact students' self-concept during these critical years (Gniewosz et al., 2012). This study examined the impact of a student's mindset, growth and failure, and their attitude toward challenges. Concurrently, this study examined how feedback influenced student mindset and gathered student narratives of the instructional

practices, interactions, and feedback that influence mindset development. Student voice was obtained through interviews to learn more about the instructional practices and messages teachers could use to help students develop the failure-is-enhancing mindset. The researcher attempted to answer the following research questions:

Research question 1. Is there a relationship between middle school students' growth mindset and their attitude toward challenges ?

Research question 2. Is there a relationship between middle school students' failure mindset and their attitudes toward challenges?

Research question 3. Do the strategy messages received by middle school students during a setback impact the focus of learning?

Research question 4. How do instructional practices influence and promote the failure-is-enhancing mindset in students?

a. Based on a student's lived experiences, which instructional practices facilitate the failure-is-enhancing mindset in students?

b. What do students perceive as necessary in the classroom for developing the failure-is-enhancing mindset?

The conceptual framework used to make meaning out of the findings was the Stage–Environment Fit theory (Eccles et al., 1991). The stage here is defined as the developmental needs of early adolescence. These have been identified as the need for a non-competitive academic setting, opportunities for autonomy, an emphasis on collaboration, and strong relationships with peers and teachers. The environment is defined as the school or the classroom setting. Traditional middle schools have often been found to emphasize competition, social comparison, and ability grouping. According to the stage–environment fit theory, the current

conditions indicate a misalignment or a lack of fit. Building a positive school culture of learning is an urgent priority. A school community that views intelligence as malleable highlights the importance of feedback, strategies, and failure as vital parts of the learning cycle. Such a community meets the developmental needs of early adolescents and has a better stage–environment fit (Barnes & Fives, 2016; Schmidt et al., 2015).

A secondary lens used in this study was the implicit theory of intelligence. Dweck (2006) classified the implicit theories of intelligence, relating to the unconscious belief of ability, as growth or fixed mindsets. Individuals with fixed mindset see intelligence and other characteristics as unmalleable. The growth mindset is seen in individuals who believe that intelligence is malleable and can be improved with extended effort, strategies, and feedback. Growth mindset has been shown to have a positive impact on a student's school experiences and self-concept as a learner (Yeager & Dweck, 2012; King, 2012).

The significance of this study is in the practical implications of the findings. By better understanding the impact of classroom practices, interactions, and feedback on student development, educators can adapt instructional strategies and classroom environments that help students develop growth mindset and a view of failure as part of the learning cycle. Holistically, these changes improve the stage–environment fit and make middle schools a developmentally appropriate learning environment for early adolescents.

Review of Literature

Chapter 2 outlines the current research on growth mindset and its documented influence on learners. The research highlighted impact on cognitions as well as emotions, which play an essential role in learning. The research has shown the potential effects of growth mindset on internal and external factors. The moderating effects of feedback have also been shown to play

an integral role in a student's view of intelligence as malleable as well as view of failure as an experience that can enhance learning. As schools strive to meet the needs of students' academic cognitions and emotions, research centered on interventions can provide insight into developing programs and communities that better support early adolescents.

Booth and Gerald (2014) described the potential effects of growth mindset on many of the internal factors that impact students' self-concept. The internal factors that are impacted by growth mindset include academic emotions (King, 2012; Shih, 2011), self-efficacy (Davis et al., 2011), and an ability to interrupt the impact of stereotype threat (Rattan et al., 2015). King (2012) found that a link between growth mindset and emotional well-being in school, self-esteem, and relationship harmony is key to learning. The fixed mindset was also found to be a negative predictor for achievement and self-esteem and a positive predictor for academic emotions.

Self-efficacy refers to the belief that one can complete a task or meet a challenge (Bandura, 2001). Through their experiment on top-dog/underdog status, Davis et al. (2011) linked the fixed mindset to feelings of helplessness and the growth mindset to a greater sense of self-efficacy. This sense of self-efficacy extended to the students who have experienced historical gaps in achievement based on their race, gender, and socioeconomic status. Rattan et al. (2015) described a correlation between the growth mindset and a student's ability to counteract the messages and biases associated with stereotype threat. Schmidt et al. (2017) explained how the growth mindset could help students move beyond stereotype threat to cultivate a sense of belonging in a learning environment.

Researchers have identified the links between growth mindset and the external factors that impact student achievement. Claro et al. (2016) surveyed tenth graders in Chile, studying the

impact of growth mindset on achievement. Examining the results through the lens of poverty, the researchers found growth mindset to be an accurate predictor of achievement at all socioeconomic levels and that students with growth mindset at the lowest socioeconomic levels outperformed those at the highest socioeconomic levels with fixed mindset.

Romero et al. (2014) found that growth mindset played a moderating effect. This moderating effect made it more likely for students to take on academic challenges, which translated into selecting more challenging courses and achieving a higher grade-point average in the end. Aditomo (2015) contributed to the literature on the impact of the growth mindset, finding that growth mindset led to resilience in the face of a setback and was a negative predictor of demotivation. These studies highlight the power of mindset. Students who believe that intelligence is malleable overcome external factors to take on challenges, persevere through challenges, and are more likely to achieve their goals.

Growth mindset includes three factors: extended effort, strategies, and feedback (Briceno, 2015). Student relationships play an essential role in mindset development. King et al. (2012) documented the impact of the support of teachers on student's academic emotions, helping them increase positive academic emotions. Barnes and Fives (2016) added to this understanding by studying the link between student-centered feedback and developing a culture of growth mindset. They found that a focus on process led to creating a healthy and supportive learning environment for early adolescents (Barnes & Fives, 2016).

As students transition from elementary to middle school, the role of parents and teachers becomes even more critical. As their learning environment changes, the messages that students receive from adults help them navigate the new setting (Symonds & Hargreaves, 2016). Gniewosz et al. (2012) found that while both students and parents use grade information in their

competence beliefs, it is the feedback of the parents that influences the development of a student's self-concept. Failure and struggle are part of the learning cycle (Oyserman et al., 2018).

Haimovitz and Dweck (2016) examined how students perceived the mindsets, both growth and failure, of their parents. They extended the understanding of the malleability of learning traits to a student's view of failure. Two mindsets were identified—failure-is-enhancing and failure-is-debilitating. The failure-is-enhancing mindset is associated with an understanding that setbacks are an opportunity to improve learning. The researchers set out to determine if students were able to perceive their parent's growth and failure mindsets. The results showed that while children struggled to interpret and identify their parent's growth mindset, the parents' reaction to struggle allowed students to predict their parents' failure mindset accurately.

Teachers also play a formative role in student's mindset development and their growth as learners. Researchers have shown that teachers' beliefs about the malleability of characteristics such as intelligence influence their instructional practices in the classroom (Shim et al., 2013). This growth mindset pedagogy influences student mindset development as well (Rissanen et al., 2018). Barnes and Fives (2016) found that an explicit focus on learning strategies and discourse about process rather than the product created a healthy and supportive learning environment. Instructional practices that develop mindset also include collaboration and discourse in a student-centered environment (Williams, 2012). Rattan et al. (2012) examined how teacher feedback influenced student mindset as well as response to challenge.

The moderating effects of feedback highlight the importance of explicitly providing interventions in order to develop growth mindset in students. The literature reviewed in Chapter 2 highlighted the effects of interventions of varying lengths on academic achievement and the classroom environment. Studies by Schleider and Weisz (2018) and DeBacker et al. (2018)

documented the power of a single session, while others have highlighted the impact of two-class-period (Yeager et al., 2016; Paunesku et al., 2015), week-long (Yeager & Dweck, 2012; Burke & Williams, 2012), and 6- and 8-week (Schmidt et al., 2017; Blackwell et al., 2007) interventions.

Beyond the length of interventions, research has highlighted the importance of the context of the classroom. Burke and Williams (2012) examined the impact of a thinking skills intervention on students' belief about the malleability of intelligence. The most substantial increase was seen in the scores of the collaborative group. Interactions with and feedback from peers help students internalize concepts. Schmidt et al. (2015) examined the mindset of the teacher and how their interactions with students might influence mindset interventions. It was found that the outcomes of the interventions were dependent on the classroom teacher. Teachers with the growth mindset infused practices, reteaching, and references into their daily work, which helped students understand and internalize an incremental view of intelligence. The research shows that interventions of various lengths can develop the growth mindset in students. Interventions, along with the instructional practices, discourse, and feedback within the classroom support students' mindset development and transition to the middle school setting.

Review of Results

The purpose of this study was to examine the correlation between mindset and a student's attitude toward challenges within the context of a classroom. The study included a survey and student interviews. Before data analysis, this researcher used exploratory factor analysis to examine and analyze the survey items. A PCA was run in SPSS to identify the components in a survey tool (Williams et al., 2012). This PCA was required due to a large number of constructs in the survey tool. The first data examined in the PCA was the KMO measure and Bartlett's Test of Sphericity. The resulting analysis showed a KMO measure of 0.684, signifying an adequate

sample size. Bartlett's Test of Sphericity resulted in a $p < .005$, which indicated that it was significant, showing at least one correlation between two of the items. The PCA resulted in 10 components with eigenvalues greater than 1.0, and this was also the case with the scree plot. A parallel analysis was used to identify the number of components to be included in the component analysis, and the comparison led the researcher to identify five components (Williams, Brown, & Onsman, 2012). According to the eigenvalues, these five components together accounted for 55% of the cumulative variance.

A component analysis was run using varimax as the rotational method. The results indicated that component 1 included items 1, 2, 3, 11, 12, 17, 22, 23, 24, 25, 27, 33, and 34; component 2 included items 7, 8, 9, 30, 31, and 32; component 3 included items 4, 5, 6, and 26; component 4 included 16, 18, 20, and 21; component 5 included items 13, 15, 19, 28, and 29. Items 2, 3, and 29 were double-loaded and, therefore, removed (Williams et al., 2012). Items 10 and 14 did not load in any factor and were discarded.

The quantitative portion of the study set out to determine the impact of growth and failure mindsets on a student's attitude toward challenges and examine how feedback within that context would influence mindset development. Since the null hypothesis was not rejected, there is potential for a Type II error. The context of the school environment should, therefore, be taken into consideration when discussing the results.

While the schools involved in the study were representative of the overall community, they had unique characteristics as well. School A included a Dual Language Immersion track, School B had been opened just over a year ago after a redesign, and School C was a Title I school with extra programs that extended the learning day. These factors could have influenced

the data outcomes. The results should be seen through this context to identify any potential Type II error that may have resulted in the negatively skewed distribution.

The qualitative portion of the study sought student voice in order to explore the context of the classroom in relation to mindset development. The researcher set out to identify and describe the feedback, learning experiences, and classroom interactions that allowed them to see the value of setbacks in the learning process. The researcher interviewed 15 students to illustrate the presence and role of failure in the middle school classroom and found that students at each school site, independent of the socioeconomic status, identified the role and value of mistakes as part of the learning process. Through the narrative gathered, it was found that the students were able to describe the interactions and practices that helped them see failure as part of the learning process that deepened understanding. The interviews also indicated that despite being able to voice the role of struggle and failure in learning, the students were not able to identify a time when feedback had helped them overcome an obstacle. The analysis of data examined the ecological factors in the classroom that led to the failure-is-enhancing mindset.

The interviews showed that middle school students understand that mistakes and setbacks are a part of learning and highlighted that very few students had experiences in the classroom that helped them learn from their mistakes and become stronger learners. Some common themes appeared throughout the interviews: (a) classroom instruction that embraces exploration and failure, (b) quality of feedback, (c) evaluation and grading practices, (d) and time.

Discussion of Results

The results of the quantitative portion of this study were unable to reject the null hypothesis, indicating a lack of correlation between the growth and failure mindsets and a student's attitude toward challenges. In order to avoid Type II errors, it is important to examine

these results in the context of the school sites. Some possible reasons for these results include unique curricular aspects of each school as well as the potential for bias. School A included a Dual Language Immersion track, School B had been opened just over a year ago after a redesign, and School C was a Title I school with extra programs that extended the learning day. These factors may have influenced the data outcomes, resulting in a large number of students self-reporting growth mindset. These results should be seen through the context of the schools, which may have resulted in the negatively skewed distribution.

Academic emotions, rather than cognitions, are often measured through self-report survey tools (West et al., 2015). The self-report model bias may impact results, particularly due to social desirability and reference bias. Social desirability bias may result in students scoring themselves higher on items such as "I am a hard worker." If a large proportion of the sample over ranks themselves, it could impact the overall data. The reference bias occurs when students' answers are influenced by the model they compare themselves with for ranking. Depending on the school community, rigor, and expectations, students may rank themselves relative to the cultural norm of their learning environment. A large number of students ranking themselves a 5 or 6 in growth mindset suggests that bias may have played a role.

The interview results indicate that students see failure as part of the learning process but lack the experience and guidance to use those obstacles for further learning. The themes that arose from the student narrative include the following: (a) classroom instruction that embraces exploration and failure, (b) quality of feedback, (c) evaluation and grading practices, and (d) time. These themes highlight the ecological factors of the classroom that lead to mindset development while creating a learning environment that is appropriate for the unique developmental needs of early adolescents.

The difference in classroom instructions and impact on mindset development was highlighted in the student responses. The students described classroom activities and instructional strategies that featured a teacher-centric model of education where "mainly the teacher takes control." Few students could describe an experience in a core class where they were able to sit with a problem and work through possible solutions. However, interviewees described this experience in STEM classes and dance classes. In each of these narratives, the students described an inquiry process that embraced exploration, trial and error, and failure. Students recognized that in learning, "there's a little bit of failure." The power of those opportunities was explained by one student from School A, "I think hands-on stuff because you can try it multiple times. And if you don't do it the first time, they give you more chances, and that means you're like learning from your mistakes."

The quality and role of feedback students received were highlighted in the interview results. Responses on feedback indicated that for students, feedback meant grades. Most students describe experiences where the feedback only came from summative assessments. The results of this study demonstrate the need for more formative assessment and opportunities for students to listen to the ideas of peers, question ideas, and use collaboration to build a shared understanding.

In addition to the amount and quality of feedback students described, many discussed changes to evaluation and grading practices. Students from School A described an effort system that allowed the teacher to document work ethic in addition to the level of understanding. Students from School B discussed the power of retakes, stating that they decreased stress and increased achievement. Revisions was the focus for students from School C:

> Yes, it really helped me so I went in at recess a couple of times and I looked in the text and was like "oh" and of course you can't use the textbook when your actually taking the test but it helped.

Whether it was the lack of time to complete work or stay on schedule or the amount of time given to work through concepts and questions, time was a theme mentioned at every school. Time allowed students to take academic risks without the fear that they would not finish, "I just like some time to sit down with that information, try to figure it out on my own." Time allowed them to think through all the possibilities during project-based learning experiences, "We work on something for like two weeks, and it's like he gives a lot of work" and the time to review, revise, and relearn challenging concepts:

> And sometimes it's just like you must have another minute or two, on an extra day of just free work time for that assignment is sometimes nice. But I don't know, for me, I just have to get through it, you know, slow and steady.

Student interview responses indicate that students are willing to take on challenges, experience failure, and continue to deepen their understanding but require time, which is often limited in our classrooms.

Discussion of Results in Relation to the Literature

This current study set out to investigate the correlation between growth and failure-is-enhancing mindsets and a student's attitude toward challenges and examine the context of the classroom as it applied to mindset development. The following section discusses those results in relation to the literature and current professional practices, through which examples of a growth mindset pedagogy emerge (Rissanen, Kuusisto, Tuomminen, & Tirri, 2019).

The results for RQ1 and RQ2 were unable to reject the null hypothesis. The analysis of these findings relates to studies that identified potential bias from the self-report format of the survey instrument (Chen et al., 2018; DeCastella & Bryne, 2014). As described in the previous section, the bias may have resulted in students scoring themselves higher when scoring items such as "I am a hard worker." Chen et al. (2018) described the moderating power of self-enhancement and self-criticism on incremental beliefs. They also documented the impact of cultural differences on self-criticism results. As this researcher set out to sample a cross-section of the metropolitan area and the cultural diversity, the results may be impacted by the cultural aspects of students that impact their response to survey items.

Different mindsets exist in various domains of the self or others (Rissanen et al., 2019). This can explain why students with equal abilities have different achievement goals. Aditomo (2015) found that growth mindset did not influence learning goals or efforts. The same may have been true in this study, where students responded to items measuring their attitude toward challenges. While the results for growth mindset were negatively skewed, the mean of 3.6 for attitude toward challenges highlighted a possible disconnect between the theory and how it translates to the learning environment.

Research question 3 was designed to explore the impact of different feedback messages on middle school students' focus on learning. During data analysis, an error was identified in the survey tool. As this error would have impacted the student's ability to interpret the feedback type, making it impossible to accurately interpret the data, RQ3 was not analyzed for the final results.

The qualitative portion of the study related to RQ4. The interview narrative collected explored the ecological aspects of the classroom that may have impacted mindset development.

The results highlighted the practices, feedback, and interactions that impact student mindset development. Also included are the aspects that students found lacking in the classroom experience. The importance of classroom interactions between the teacher and students, generally through instructional practices and feedback, has been highlighted in the stage–environment fit data as well as the studies examining the growth mindset (Hochandel & Finamore, 2015; Symonds & Hargeaves, 2016). As these results were examined through the lens of the stage–environment fit theory, several themes arose related to instructional practices and school policies that can better meet the needs of early adolescents. These themes include the following: (a) classroom instruction that embraces exploration and failure, (b) quality of feedback, (c) evaluation and grading practices, and (d) time.

Classroom instruction. The current literature highlights the importance of teachers in creating a learning environment that differentiates in order to meet the unique learning needs of each student (Rissanen et al., 2019). While early adolescents typically experience less choice in class (Hughes & Cao, 2018), the students interviewed in this study highlighted the need for exploration, reflection, and quality feedback to address misconceptions. The student-centric and inquiry-based approach identified by student describes a constructivist approach to learning that recognizes that constructing meaning takes different forms and requires different lengths of time (Thiele, 2018).

This approach to instruction helps students in three ways. Differentiation ensures process-focused teaching and provides instructional and emotional support to students. Research has highlighted that differentiation allows a teacher to provide the instructions and support needed by individual students, thus, helping to create a "good fit" in middle school classrooms (Quin et al., 2018). Haimovitz and Dweck (2017), while examining failure mindset, found that process-

focused teaching and classroom culture are key, along with teacher's model responses to success and failure. The collaborative nature of the inquiry-based classroom allows teachers to tailor their teaching so students understand that they can ask for instructional and emotional support (Quin et al., 2018).

Role and quality of feedback. Feedback is one of the most influential factors in learning (Hattie, 2009). Rissanen et al. (2019) highlighted the importance of the feedback students receive. The students interviewed for the current study linked feedback with summative grades and comments. Rissanen et al. (2019) described effective feedback as feedback that praised courage and strategies. A focus on learning-to-learn goals helps students find reasons for their challenges outside of their personal qualities. The focus then is on formative feedback.

A holistic approach to teaching includes teaching to develop the growth mindset, which allows students to take risks and challenges and for creativity to be a central factor in the classroom (Kuusisto et al., 2017). The students interviewed in this study most often identified feedback as the summative grade on an assignment or assessment and accompanying comments such as "Good job" or "Come see me." These observations underscored the findings of Rissanen et al. (2019).

Although teachers understand the importance of failure in the learning process, educators often fail to provide the needed critical feedback in order to focus on the motivating power of success. In the narratives gathered in this current study, students repeatedly mentioned the supportive and coaching nature of their teachers. However, only one student out of 15 described a time when a dance teacher provided critical feedback and allowed the student to experience the resulting disequilibrium. This is contrary to the growth mindset pedagogy, which requires

teachers to give guidance through honest critical feedback while providing the support that maintains hope for improvement and, in the end, motivates students to continue.

Grading practices. Assessment for learning guides and promotes learning (Finnish National Agency of Education, 2014). The students involved in the current study offered opinions on several methods teachers used to keep students motivated and focused on learning; the Dual Language Immersion track used an effort grade, while others used revisions and re-testing. These methods seemed to be leaning toward, but not actually implementing, standards-based instruction or grading by proficiency.

Schimmer (2014) outlined the advantages of standards-based mindset and grading: (a) it grades only learning; (b) it gives full credit despite the time taken to achieve that depth of understanding; (c) it redefines accountability by making the student responsible for learning; (d) the grades increase confidence. The development of mindset is impacted by a students' understanding of the learning targets as well as their grades and what they represent (Thiele, 2018). Standards-based grading practices allow students to see their learning and work with peers to continue learning.

Delimitations and Limitations

Delimitations. Delimitations are factors that the researcher believes may impact the outcomes of the study (Simon, 2011). This researcher identified the following delimitations for this study: (a) the self-report format of the survey, (b) open-ended qualitative questions included in the interview, and (c) data analysis that describes correlation rather than causation.

In this study, the researcher used the survey method to allow students to report their beliefs about mindset, attitude toward challenges, and response to feedback themselves. This delimitation had been identified in several of the studies in Chapter 2 (for instance, Schmidt et

al., 2015; DeCastella & Byrne, 2014). While some studies show that students may be hesitant to provide honest responses, the results of other studies have shown that statistically significant results can be collected. This researcher strived to identify an adult that the students felt comfortable with to facilitate the survey. The negative skewness of the growth mindset construct indicates that this survey method may have led to bias, as the students were asked to evaluate themselves with reference to statements such as "I am a hard worker."

Fowler (2014) stated that self-reporting in open-ended questions often did not produce useful data, since an interviewer wasn't there to probe and ask clarifying questions. Hence, 15 students were interviewed by this researcher to have the opportunity to ask probing follow-up questions. In this study, the researcher prioritized the diversity of respondents. The narratives gathered from each of the interviews allowed the researcher to identify potential best practices and make recommendations for the direction of future studies.

The research design of the study was the final delimitation (Fowler, 2014). The schools included in this study were diverse; all the schools were members of a single school district. Convenience sampling at the classroom and building level eliminated the possibility of random sampling. This researcher strived to ensure that the schools included in the study had demographics representative of the overall population. The schools in this sample included diversity based on race and socioeconomic status—one with 18% of the students on free or reduced lunch, one with 57%, and the third with over 95% students on free or reduced lunch.

The research design for this study included the decisions made by this researcher that may have affected the findings (Simon, 2011). These delimitations included the self-report format of the survey, format of the qualitative questions, data analysis procedures, and the use of

convenience sampling. This researcher worked to establish the sampling procedures that increase the likelihood of honest responses from a diverse sample.

Limitations. Limitations are factors in a study that are out of the control of the researcher and may potentially affect the findings of the study (Simon, 2011). The limitations in this study were focused on the following categories: (a) the districts and schools that agreed to take part, (b) the students and families who gave their consent, and (c) the instrumentation of the survey.

The first limitation identified in this study centered on the districts and the schools included in the study (Simon, 2011). The sample frame includes several school districts across a large metropolitan area. Approval of the study was provided by the largest and most diverse school district in the area.

Prior to the data collection, student and parental consent was identified as a potential limitation (Simon, 2011). This researcher reached out to various schools and student populations to gather data that represented the total population. In order to communicate the purpose of the study clearly and concisely, the consent forms were translated into the five most common languages spoken in the district. Low returns of parental consent forms were a limitation for this study, with only 14 families providing consent from the school with the largest percentage of historically underserved families.

The final limitation was the impact of the instrument on the overall results (Simon, 2011). Since this study focused on seventh graders, this researcher modified the items in the survey to make them accessible to young adolescents. The students who understood the goal of the study and that student anonymity would be protected and felt valued for their opinions of the educational transition they are experiencing would be more likely to be truthful in their responses. West et al. (2015) suggest that student results could be misleading due to reference

bias. Although this is found less in measurements of growth mindset than in other noncognitive characteristics, the fact that four tools were used in the quantitative portion may have impacted the results. The negatively skewed results for the growth mindset construct indicate that this bias may have impacted the overall results.

The exploratory component analysis, used to gain a better understanding of the relationships and correlations between survey items, resulted in five components with a range of items in each. Component 1 had 11 items, component 2 included six, components 3 and 4 both had four survey items, and component 5 included five items. In addition to a varying amount of survey items, each component was comprised of items from more than one survey tool. The unintended result may have been a misunderstanding of what was being measured. As this researcher sought to examine the presence or absence of a correlation, what was being measured may have been something other than was anticipated. A thematic factor analysis of the survey items in each component may have provided this researcher a better understanding of the tool and the data analyzed in this study.

The limitations in this study included the participating schools and districts, demographics of the students, and the survey tool (Simon, 2011). Throughout the data collection process, considerations and efforts were made to ensure that the sample represented the general population.

Implications of the Results for Practice, Policy, and Theory

Growth mindset pedagogy has been defined as the process focused on the actions and practices of teachers in the classroom (Rissanen et al., 2019). This pedagogy develops mindset in the following ways: (a) supporting students' individual learning process, (b) promoting mastery orientation, (c) persistence, and (d) fostering students' process-focused thinking. When viewing

the results of this study through the lens of the growth mindset pedagogy and the Stage–Environment Fit theory, the results highlight the interactions, instructional strategies, and policies that have an impact on student learning during this critical transition from elementary to high school. The implications of the current study include the following: (a) inquiry-based instruction, (b) standards-based grading, (c) quality feedback, (d) building autonomy through increased peer interaction, (e) scheduling, and (f) the power of the classroom teacher. These implications apply to the classroom level as well as the policies and practices of schools, districts, and teacher education programs.

Inquiry-based instruction. The classroom activities and instructional strategies described by 13 of the 15 students interviewed described a teacher-centric model of education. When discussing elective courses such as STEM and dance, the students were able to identify the moments when they were able to brainstorm ideas, gather formative feedback, and embrace failures, which led to greater understanding. The active learning approach of inquiry-based learning can be used to increase higher-level learning (Richmond, Fleck, Heath, Broussard, & Skarda, 2015). Contrary to the description of a conventional classroom setting, inquiry-based learning allows students to identify and describe learning experiences that allow them to learn from their mistakes and, eventually, overcome misconceptions. Inquiry-based strategies also allow teachers to use differentiation as a part of their pedagogical practice. This differentiation allows teachers to provide the instruction and support needed by individual students, creating a "good fit" in middle school classrooms (Quin et al., 2018).

While changes in instructional focus can be made at the individual classroom level, systemic changes will occur only when inquiry-based learning is adopted at the district level and by teacher training programs.

Feedback. The growth mindset pedagogy seeks to foster students' process-focused thinking (Rissanen et al., 2019). This comes from praising courage, strategies, and effort rather than providing supportive comfort feedback, which was described by the students interviewed in this study. A switch from summative to formative feedback that includes the teacher's strategies, the positive role of mistakes, and challenges can also impact mindset development. One student from School C described an interaction with a teacher that only requested that a fellow student "at least put their name on it." Changing the mode and quality of feedback teaches students that there is no point in taking on a task that is too easy; it is more important to take on an academic challenge (Rissanen et al., 2019).

The current study also noted a lack of peer feedback. Quin et al. (2018) noted the importance of peer interactions and influence when examining the results through the lens of ecological theories such as the stage–environment fit theory. The researchers found that interactions between students needed to be facilitated and explicit skills needed to be taught and fostered to keep them focused on learning and overcoming challenges. This aspect of feedback was missing in the learning experiences of most students interviewed. Ruegg (2015) found that peer feedback led to more successful revision attempts. Moreover, as teachers help build skills and strategies, peer feedback allows learners to critically evaluate the feedback to determine which feedback to utilize or when to reach out for further clarification (Ruegg, 2015).

Scheduling. The narratives gathered from the 15 seventh graders in the current study highlighted the pressure of time on both teachers and students. A student at School B, a school with seven 45-minute classes in a learning day, expressed empathy for his teacher, who felt the crunch of time. The teacher struggles to keep up with the aligned scope and sequence in the allotted timeframe. Beyond covering the curriculum, we heard more often from the interviewees

that each of the instructional activities that the students described as helpful required time. The implications of this study suggest that schools and districts should examine current scheduling practices, including the number and duration of classes. With an eye on learning, the conditions that increase student time with the content and student learning must be identified. Funding policies at the district level should take into account the impact of a six-period or seven-period day versus that of block scheduling on student relationships, time spent on a task, and the ability to reflect and revise as part of the learning process.

Power of the classroom teacher. During the transition from elementary to middle school, the classroom teacher plays an integral role as early adolescents struggle to interpret the feedback in the new learning environment and build a healthy self-concept (Gniewosz et al., 2014). Hughes and Cao (2018) explained that higher levels of teacher emotional support and lower levels of teacher conflict protected students from the declining achievement and engagement that is typically observed at this stage. In the current study, 14 of the 15 students were able to identify a time when a teacher had helped them overcome an obstacle. The positive aspects of a teacher–student relationship seemed to exist.

One implication of the current study is how to improve upon that relationship with regard to teachers to provide specific and critical feedback that will help students grow as learners. Haimovitz and Dweck (2016) explained that the feedback children receive impacts their self-concept and view of intelligence; it is easier for them to interpret failure mindsets and feedback, which can inadvertently impede learning and motivation. The teacher mindset plays an integral role.

In their study, Schmidt et al. (2015) examined the impact of teachers' mindset on the outcomes of a growth mindset intervention. There were significant differences in the results of a

growth mindset intervention that could be attributed directly to the classroom teacher. Teachers with the true growth mindset infuse practices, reteaching, and references into their daily work, which help students internalize an incremental view of intelligence. This pedagogy includes verbalizing, modeling, thinking, planning instruction where students will experience a setback, and helping students identify the factors that lead to failure (Rissanen et al., 2019). Within the context of the classroom, the instruction, feedback, and messages teachers provide play a central role in ensuring a good fit between the developmental needs and the school environment (Quin et al., 2018). A final implication of the current study is the need for developing an educator mindset as well as professional development on the growth mindset pedagogy.

Rissanen et al. (2019) described the philosophy of educators in Finland that led to a growth mindset pedagogy. These educators believe that all students can achieve and that it is the teacher's responsibility to embrace the learning challenges of the weakest learners to differentiate and support them as they work toward proficiency. These beliefs and mindset should be incorporated into the educator training programs in the United States. The current research in the U.S. examines growth mindset interventions and the impact on students. Rissanen et al. suggest that a transformative change is possible in the field of education as it applies to student achievement and narrowing the achievement gap.

Recommendations for Future Research

The current study identified areas that may have an impact on mindset development and the process-focused aspects of learning, which may help students overcome obstacles: (a) inquiry-based instruction, (b) standards-based grading, (c) quality feedback, and (d) power of the classroom teacher.

The narrative collected in the current study identified the potential for active student-centered instruction, such as inquiry-based instruction and standard-based assessment practices, for promoting a focus on process and growth mindset. An area that requires future research is quantifying if there is a correlation between these practices and student mindset, both growth and failure. A number of studies in the current literature focus on interventions instead of the instructional climate of the classroom. It would be helpful for practitioners, moving forward, to understand the influence of grading and instructional practices on the mindset development of young learners.

In addition to quantifying the relationship between instructional practices and mindset, an area for future research is the use of thematic analysis on the quantitative survey tool in addition to qualitative work being done in the field. The coding of survey items and identification of themes will allow researchers to understand if the items in each component are measuring the same themes and if data analysis procedures are measuring the constructs the researcher anticipated. This will allow researchers to better understand the analysis of data and lead to richer analysis.

Haimovitz and Dweck (2017) noted a gap in the literature pertaining to the feedback students receive as a result of setback and failure. This study highlights a disconnect between the theory of feedback and how it is implemented in the classroom. An area for future research is the examination of the growth mindset pedagogy in practice in middle schools. Rissanen et al. (2019) used a Dweck instrument to identify teachers with an incremental view of intelligence. This researcher would propose the identification of teachers and then grounding theory research design to identify, through classroom observations, the pedagogical practices that promote mindset development through critical feedback. This research would be essential in identifying

the best practices of formative feedback that communicate learning goals, self-reflection, the power of revision, and overcoming obstacles with early adolescent learners. This would allow educators to help students develop the mindset and skills to grow as autonomous learners.

Conclusion

The purpose of this study was to examine the ecological factors that influence a student's willingness to embrace challenges. The transition from elementary school to middle school has been described as critical (Ellerbrock & Kiefer, 2013). In order to better meet the needs of students, schools must work to create a climate that will meet the students' developmental needs, which will be key for increasing students' cognitive and noncognitive attributes (Pyne et al., 2018). Often excluded is the important relationship between the teacher and the student in the context of the classroom, which is established through feedback and instructional practices (Barnes & Fives, 2016; Schmidt et al., 2015). This mixed methods study set out to explore the ecological factors of the classroom that impact students' growth and failure mindsets and their attitude toward challenges by examining the instructional practices and feedback that facilitate mindset development.

The conceptual frameworks used to frame this study through the literature review and the lens through which the results were viewed were primarily the stage–environment fit theory (Eccles et al., 1993) and secondarily the Mindset Theories of Intelligence (Dweck, 2006). The Stage–Environment fit theory described the changing social environment as early adolescents transitioned from elementary to middle school (Eccles & Roeser, 2011). In their model, the stage is defined as the developmental needs of early adolescence—specifically, the need for a non-competitive academic setting, opportunities for autonomy and decision-making, an emphasis on collaboration and peer relationships, and extended contact with teachers (Eccles et al., 1991).

The quantitative and qualitative portions of the current study sought to identify the accommodations made in the classroom that met the developmental needs of the students by providing autonomy, fostering strong peer relations, focusing on the process, promoting collaboration, and building positive student–teacher interactions.

The mixed methods research design was used to allow this researcher to gain a stronger understanding of events in the classroom and their impact on mindset development. The mixed methods approach allowed the researcher to explore the relationship between mindset and attitude toward challenges while ensuring that the cultural context of the classroom and the voices of students were included. The quantitative portion of the study examined the relationship between growth or failure mindset as well as the student's willingness to embrace challenges.

This study also focused on the context of the classroom, allowing the researcher to identify the instructional practices that help students develop the failure-is-enhancing mindset. The findings of this study will allow educational practitioners to explore how the mindset of the individual is related to the interactions and instructional practices of the classroom. These relationships, viewed through the lens of the stage–environment fit theory (Roeser & Eccles, 1998), will provide insight as schools work to make accommodations to meet the developmental needs of students and ensure that the students' voice is heard in the work.

The quantitative portion of the study set out to determine the impact of the growth and failure mindsets on a student's attitude toward challenges. For both RQ1 and RQ2, the null hypothesis was not rejected. While the results indicate that there was no correlation between either growth or failure-is-enhancing mindset and a student's attitude toward challenges, it was important to explore the possible reasons for those results to avoid Type II errors. The context of the school environment must, therefore, be taken into consideration; School A included a Dual

Language Immersion track, School B had been opened over 1 year ago after a redesign, and School C was a Title I school with extra programs that extended the learning day. These factors may have influenced the data outcomes.

The qualitative portion of the study consisted of 15 interviews that gathered student voice to explore the context of the classroom as it related to mindset development. This study extended the current understanding of the impact of teachers' feedback and instructional practices on student mindset. The results documented that the students at each school site, independent of socioeconomic status, identified the role and value of mistakes as part of the learning process. The findings also described a disconnect as, while understanding the importance of failure, the students were not able to identify a time when feedback had helped them overcome an obstacle. The analysis of data examined the ecological factors in the classroom that led to a failure-is-enhancing mindset. Through the analysis of the transcripts, the following themes were identified: classroom instruction that embraces exploration and failure, quality of feedback; evaluation and grading practices; and time.

This study examined the ecological factors that influence a student's willingness to embrace challenges. By focusing on student narrative, this study identified the aspects of the classroom culture that impacted mindset development. The results of this study highlight the practices, feedback, and interactions that, according to the students, had an impact on mindset development as well as the aspects that students found lacking in the classroom experience. The results of this survey point to student-centered and inquiry-based instruction that provides students with a constructivist approach to learning and recognizes that constructing meaning takes different forms and requires different lengths of time (Thiele, 2018).

The findings revealed a need for a focus on formative feedback. Students involved in the current study offered opinions on several methods teachers used to keep students motivated and focuses on learning. These methods pointed to the need for standards-based instruction or grading by proficiency. The students in this study echoed the current literature that emphasized that the development of mindset is impacted by students' understanding of the learning targets and the understanding of their grades and what they represent (Thiele, 2018). Taken together, these findings describe what has come to be known as the growth mindset pedagogy (Rissanen et al., 2019). Extending this learning further will help our early adolescents during the middle school transition as they grow into independent and active learners.

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Appendix A: Letter of Consent

Research Study Title:	The Effect of Classroom Interactions and Instructional Practices on Mindset Development and Students' Attitude toward Challenges
Principal Investigator:	Cherie Kinnersley
Research Institution:	Concordia University–Portland
Faculty Advisor:	Dr. Belle Booker-Zorigian

Purpose of the Study

The purpose of this study is to examine the relationship between the mindset and a student's attitude toward challenge while taking into account the context of the classroom in that mindset development. Participant responses will address growth and failure mindset, their attitude toward challenge, and response to feedback. Participating students will be surveyed in September 2019 in their science classrooms. The surveys will take 15–20 minutes to complete, followed by a short interview of five students randomly selected from each site. This interview will allow the researcher to gain insight into student experiences in the classroom that help them with challenges and transitioning to middle school. We expect to survey approximately 90 volunteers and interview five from each site.

Risks

There are no risks to students participating in this study other than the normal experience when students are taking a short quiz in class. The surveys will be collected, without names and removed from the school immediately after the surveys are collected. There are no risks to participating in this study other than providing their answers. When I look back at the data, none of the data will have your child's name or identifying information. We will use a secret code to analyze the data. The data will be analyzed along with that collected from other schools and districts. There will be no way for anyone to identify the child or the school in any publication or report.

Benefits

The information your child provides in the survey will help me gather a better understanding of the instructional strategies and interactions with a teacher that help middle schoolers become comfortable with challenges. Utilized on a larger scale, the results may help us create middle schools that better support young learners.

Confidentiality

The information your child provides by participating in the survey will not be distributed to any other agency, and it will be kept private and confidential. Data specific to your child and the school will not be identified. The information shared in interviews will be gathered through recording. These recordings will be deleted immediately after transcription and member-checking. All other study-related materials will be kept securely for three years and will then be destroyed. The only exception to this is if your child tells me about abuse or neglect that makes me seriously concerned for their immediate health and safety.

Right to Withdraw
The participation of your child in the study is greatly appreciated and it is acknowledged that questions may be personal in nature to learning. He/she will be free at any point to choose not to engage with or stop the survey. They may skip any question(s) they do not wish to answer.

Contact Information
You will receive a copy of this consent form. If you have questions, you can write to the principle investigator at [redacted] If you want to talk with a participant advocate other than the investigator, you can write or call the director of our institutional review board, Dr. Ora Lee Branch (email obranch@cu-portland.edu or call 503-493-6390).

Your Statement of Consent
I have read the above information. I asked questions if I had them, and my questions were answered. I volunteer my consent for this study.

_____ _____
Parent/Guardian Name Date

_____ _____
Parent/Guardian Signature Date

_____ _____
Investigator Name Date

_____ _____
Investigator Signature Date

Investigator: Cherie Kinnersley; email: [redacted]
c/o: Professor Dr. Belle Booker-Zorigian;
Concordia University–Portland
2811 NE Holman Street
Portland, Oregon 97221

同意书

研究课题： 课堂互动和教学实践对学生思维发展和挑战态度的影响

主要研究员： Cherie Kinnersley

研究机构： 康卡迪亚大学——波特兰

指导教授： Belle Booker-Zorigian 博士

研究目标和您将要完成的内容：

本研究的目的是探讨心态与学生对挑战的态度之间的关系，同时考虑到课堂环境对学生心态发展的影响，参与者的反应将涉及成长与失败心态、他们对挑战的态度以及对反馈的反应。参与调查的学生将于 2019 年 9 月在科学课堂进行调查，调查时间为 15-20 分钟，且每个地点随机抽取 5 名学生进行简短的采访。这次采访将使研究人员深入了解学生在课堂上的经历，帮助他们应对挑战和过渡到中学。我们预计将调查约 90 名志愿者，并采访来自每个地点的 5 名志愿者。

风险：

除了学生在课堂上做小测验时（即正常填写调查问卷）外，参与本研究没有任何风险。调查问卷将以不记名的方式收集，并在收集完调查问卷后立即从学校处删除。参与这项研究除了提供他们的答案外没有任何风险。当我再次检查这些数据时，没有一个数据会有您孩子的名字或身份信息。我们将只使用一种神秘代码来分析数据。这些数据将与其他学校和地区的数据一起进行分析，且任何人都无法在任何出版物或报告中识别处参与研究的孩子或学校。

收益：

在您的孩子参与本次调查问卷的帮助下，其所提供的信息将有助于更好地理解教学策略和与老师的互动，帮助六年级学生适应挑战。在更大规模的范围内使用这些结果，可以帮助我们创建一所更好地支持年轻学习者的中学

保密性：

您的孩子通过参与本次调查问卷而提供的信息将不会被分发给任何其他机构，这些信息将获得严格保密。具体到您的孩子和学校的数据将不会被他人识别出来。采访中分享的信息将通过录音收集。这些录音在转录完成和成员检查后，将被立即删除。所有其他与研究

相关的材料将被安全保存 3 年，然后销毁。唯一的例外之处是，如果您的孩子告诉了我们关于虐待或忽视的问题时，我们需要更认真严肃地关注他们的即时健康和安全情况。

自由退出权：

我们非常感谢您能够参与研究，同时，我们承认，调查问卷的问题可能是关于学习本性的个人隐私信息。您可以在任何时候自由地选择不参与或停止本次调查问卷。他们可能会跳过您不想回答的任何问题。

联系方式：

您将收到一份这份同意书的副本。如果您有任何问题，可以通过发送电子邮件到：[redacted] 向主要研究员提问。如果您想与研究人员以外的参与者或研究倡导者交谈，您可以写信或致电我们的机构审查委员会主任 OraLee Branch 博士（邮箱：obranch@cu-portland.edu 或致电：503-493-6390）。

您的同意书：

我已经阅读了上面的信息。如果我有任何问题，我就会进行提问，然后我提出的问题已得到回答。我自愿同意参与这项研究。

_____	_____
参与者姓名	日期
_____	_____
参与者签名	日期
_____	_____
研究员姓名	日期
_____	_____
研究员签名	日期

研究员：Cherie Kinnersley; 邮箱：[redacted]
c/o: Belle Booker-Zorigian 博士；
康卡迪亚大学——波特兰
俄勒冈州波特兰市
霍尔曼街（东北走向）2811 号，邮编 97221

MẪU CHẤP THUẬN

Tên Đề tài Nghiên cứu: Ảnh hưởng của Tương tác trong Lớp học và Thực hành Giảng dạy đến Quá trình Phát triển Tư duy và Thái độ của Học sinh Đối với Thử thách

Chủ nhiệm Đề tài: Cherie Kinnersley

Viện Nghiên cứu: Đại học Concordia - Portland

Cố vấn Khoa: Tiến sĩ Belle Booker-Zorigian

Mục đích và những việc Quý vị sẽ thực hiện:

Mục đích của nghiên cứu này là kiểm tra mối quan hệ giữa tư duy và thái độ của học sinh đối với thử thách, đồng thời xét đến bối cảnh của lớp học trong quá trình phát triển tư duy đó. Câu trả lời của người tham gia sẽ đề cập đến tư duy phát triển và tư duy thất bại, thái độ của họ trước thử thách và phản ứng lại thông tin phản hồi. Những học sinh tham gia sẽ được khảo sát trong tháng 9/2019 tại lớp học khoa học của họ. Cuộc khảo sát sẽ kéo dài khoảng 15-20 phút và được tiến hành bằng một cuộc phỏng vấn ngắn 5 học sinh được lựa chọn ngẫu nhiên tại mỗi địa điểm. Cuộc phỏng vấn này sẽ giúp nhà nghiên cứu có cái nhìn sâu sắc về trải nghiệm của học sinh trong lớp học cũng như giúp họ vượt qua thử thách và chuyển tiếp lên trường trung học.

Chúng tôi kỳ vọng sẽ khảo sát khoảng 90 tình nguyện viên và phỏng vấn 5 người tại mỗi địa điểm.

Rủi ro:

Không có bất kỳ rủi ro nào khi tham gia vào nghiên cứu này ngoại trừ trải nghiệm bình thường khi học sinh làm bài kiểm tra ngắn trong lớp học. Phiếu trả lời khảo sát sẽ được thu thập mà không có tên người tham gia và được loại bỏ khỏi trường học ngay sau khi được thu thập. Không có bất kỳ rủi ro nào khi tham gia vào nghiên cứu này ngoài việc đưa ra câu trả lời. Khi tôi nhìn lại dữ liệu, ở đó sẽ không có dữ liệu nào chứa tên con Quý vị hoặc thông tin xác định danh tính. Chúng tôi sẽ sử dụng mã bí mật để phân tích dữ liệu. Dữ liệu sẽ được phân tích cùng với dữ liệu từ các trường và khu học chánh khác. Không có cách nào để bất kỳ ai có thể xác định được danh tính của trẻ hoặc trường học trong bất kỳ tài liệu xuất bản hoặc báo cáo nào.

Lợi ích:

Thông tin mà con Quý vị cung cấp khi tham gia vào cuộc khảo sát này sẽ giúp chúng tôi hiểu rõ hơn về các chiến lược giảng dạy và tương tác với giáo viên, từ đó giúp học sinh lớp 7 cảm thấy thoải mái đương đầu với thử thách. Sử dụng ở quy mô rộng lớn hơn, kết quả thu được có thể giúp chúng tôi kiến tạo các trường trung học hỗ trợ tốt hơn cho trẻ.

Bảo mật:

Thông tin mà con Quý vị cung cấp khi tham gia vào cuộc khảo sát này sẽ không được phân phát cho bất kỳ cơ quan nào khác và được giữ kín và bảo mật. Dữ liệu đặc trưng cho con Quý vị và trường học sẽ không được nhận dạng. Thông tin được chia sẻ trong các cuộc phỏng vấn sẽ được thu thập bằng cách ghi âm. Những bản ghi âm này sẽ bị xóa bỏ ngay sau khi chép lại và xác nhận người tham gia. Tất cả các tài liệu khác liên quan đến nghiên cứu này sẽ được cất giữ một cách an toàn trong vòng 3 năm và sau đó sẽ được tiêu hủy. Trường hợp ngoại lệ duy

nhất ở đây là khi Quý vị chia sẻ với tôi về hành động lạm dụng hoặc bỏ bê buộc chúng tôi phải nghiêm túc quan tâm đến sức khỏe và sự an toàn của trẻ ngay tức thì.

Quyền rút lại:
Sự tham gia của Quý vị vào nghiên cứu này được đánh giá rất cao và người ta thừa nhận rằng các câu hỏi có thể mang tính cá nhân trong học tập. Quý vị có thể tự do chọn không tham gia hoặc ngừng khảo sát bất cứ lúc nào. Quý vị có thể bỏ qua bất kỳ câu hỏi nào mà Quý vị không muốn trả lời.

Thông tin Liên hệ:
Quý vị sẽ nhận được một bản sao của mẫu chấp thuận này. Nếu Quý vị có câu hỏi nào, Quý vị có thể gửi email cho người nghiên cứu tại địa chỉ: [redacted]. Nếu Quý vị muốn nói chuyện với người hỗ trợ đối tượng tham gia vào nghiên cứu, Quý vị có thể gửi email hoặc gọi cho Tiến sĩ OraLee Branch, giám đốc hội đồng xét duyệt của trường chúng tôi (gửi email đến: obranch@cu-portland.edu. hoặc gọi tới số: 503-493-6390).

Tuyên bố Chấp thuận của Bạn:
Tôi đã đọc kỹ những thông tin trên. Tôi đã đặt câu hỏi (nếu có) và câu hỏi của tôi cũng đã được trả lời. Tôi tự nguyện chấp thuận tham gia vào nghiên cứu này.

_____ _____
Tên Người tham gia Ngày

_____ _____
Chữ ký của Người tham gia Ngày

_____ _____
Tên Người nghiên cứu Ngày

_____ _____
Chữ ký của Người nghiên cứu Ngày

Người nghiên cứu: Cherie Kinnersley; Email: [redacted]
Đồng kính gửi: Giáo sư Tiến sĩ Belle Booker-Zorigian;
Đại học Concordia – Portland
2811 NE Holman Street
Portland, Oregon 97221

Foomka Ogalaanshaha

Ciwaanka Daraaada Cilmi-baadhista: Saameynta is-dhex galka fasalka iyo nidaamyada sharaxaada ee horumarinta fikirka iyo hab-dhaqanka ardeyga ee caqabadaha.

Baadheha Koobaad: Cherie Kinnersley
Haayada Cilmi-baadhista: Jamacada Concordia – Ee Portland
La-taliyaha Kuliyada: Dr. Belle Booker-Zorigian

Ujeedada iyo waxa aad qaban doonto:

Ujeedada daraasadani waa in la baadho xidhiidhka ka dhexeeya fikirka iyo hab-dhaqanka ardeyga ee caqabadaha, iyadoo lagu xisaabtamaayo deegaanka fasalka ee horumarinta fikirkaasi, jawaabaha ka qeybqaatuhu waxay ka hadli doonaan koritaanka iyo guuldarada fikirka, hab-dhaqankooda caqabadaha iyo jawaabaha warcelinta. Ardeyda ka qeybqaadanaysa waxa xogta laga ururin doonaa September 2019 fasalkooda sayniska dhexdiisa, xog-ururintu waxay qaadan doontaa 15-20 mirir oo wareysi gaabana si loo doorto 5 ardey oo aan kala sooc lahayn goobtiiba. Wareysigani wuxuu u ogalaan doonaa cilmi baadhaha inuu helo fahan khibradaha ardeyga ee fasalka oo ka caawin doona caqabada iyo u gudbida dugsiga dhexe. Waxaanu rajeyneynaa inaanu wareysano ku dhawaad 90 mutadawac oo aan wareysano 5 dhiniciiba.

Khataraha:

Ma jiraan wax khataro ka qaybqaadashada daraasadan oo aan ka ahayn khibrada caadiga ah marka ay ardeydu qaadaneyso su'aalaha kadiska ah ee fasalka. Xog-ururinta waa la ururin doonaa, iyadoo bilaa magacyo ah, iskuulka ayaana si dedgdega looga saari doonaa ka dib marka xog-ururinta la ururiyo. Ma jiraan wax khataro ah oo ku lugleh ka qeybqaadashada daraasad oo aan ka ahayn jawaab bixintooda. Markaan dib u eego xogta, midnaba xogta ma yeelan doono magaca ilmahaaga ama xogta lagu aqoonsanayo. Waxaanu kaliya isticmaali doonaa furayaal sira si aanu u falanqeyno xogta. Xogta waxa lala falanqeyn doonaa xogta iskuulada iyo degmooyinka kale, ma jiri doono wado qofna ku aqoonsado ilmaha ama iskuulka daabacaad kasta ama warinkasta.

Faa'idooyinka:

Macluumaadka ilamahaagu bixiyo isagoo ka qeyb galaya daraasadu waxay caawin doontaa ururinta fahanka fiican ee nidaamka sharaxaada iyo is dhexgalka ee macalinka taasi oo caawineysa fasalka 6aad in ay ka gudbaan caqabadaha. Iyadoo si weyn looga faa'idaysanayo natiijadu waxay naga caawin kartaa inaan abuurno dugsi dhexe oo si wanaagsan u taageera wax-barashada ardeyda.

Qarsoodinimada:

Xogta ilmahaagu bixiyo isagoo ka qeyb galaya daraasada lalama wadaagi doono wakaalad kale waxaana lagu ilaalin doonaa sir iyo qarsoodi. Xogta u gaarka ah ilmahaaga iyo islkuulka lama aqoonsan doono. Xogta lagu wadaago wareysiga waxa lagu ururin doonaa duubis. Duubitaanadani si degdega aya loo masixi doonaa ka dib marka la qoro oo xubi eegto. Dhamaan waxyaabaha kale ee la xidhiidha daraasada waxa loo ilaalin doonaa si amaan ah mudo 3 sano ah, ka dibna waa la burburin doonaa. Ta kaliya eek a reeban tani waa hadii aad

noo sheegto xadgudub ama dayacaad keenaysa inaan si weyn uga walaacno caafimaadkooda iyo amaankooda.

Xuquuqda Ka Bixitaanka:
Ka qeyb galkaaga daraasadani si weyn ayaa lagaaga mahadcelinayaa waxaana la qirayaa in su'aalaha qaar ay noqon karaan shakhsi dhanka waxbarashada. Waxaad xor u ahaan doontaa markasta inaad doorato in aanad ku luglahaan ama aad joojisid daraasada. Waxay iskaga boodi karaan su'aasha (laha) aanad rabin in ay ka jawaabaan.

Xogta Lagalasoo Xidhiidhayo:
Waxaad heli doontaa nuqul foomkan ogolaanshaha ah. Hadii aad su'aalo qabto, waxaad ugusoo qori kartaa baadhaha koobaad iimaylka [redacted]. Hadii aad rabto inaad la hadasho ka taageere ka qaybqaate oo aan ahayn baadheha, Waxaad usoo qori kartaa ama soo wici kartaa agaasimaha Qeybtayada Dib-u eegista ee Hayada, Dr. OraLee Qeybta (iimaylka obranch@cu-portland.edu ama soo wac 503-493-6390).

Bayaankaaga Ogalaanshaha:
Waxaan akhriyey xogtan sare. Waxaan weydiiyey wixii aan su'aalo qabay, su'aalahaygiina waa laga jawaabey. Waxaan ugu tabarucayaa ogalaanshahayga daraasadan.

_____ _____
Magaca ka qeybgalaha Taariikhda

_____ _____
Saxeexa ka qeybgalaha Taariikhda

_____ _____
Magaca baadheha Taariikhda

_____ _____
Saxeexa baadheha Taariikhda

Baadhe: Cherie Kinnersley; iimayl: [redacted]
c/o: Aqoonyahan Dr. Belle Booker-Zorigian;
Jamacada Concordia – Ee-Portland
2811 NE Holman Street
Portland, Oregon 97221

БЛАНК СОГЛАСИЯ

Название научного исследования: Влияние взаимодействий в классе и практических занятий на формирование восприятия и отношение учащихся к сложным задачам

Ответственный исследователь: Чери Киннерсли

Научное учреждение: Университет Конкордия - Портленд

Научный руководитель: Доктор Белль Букер-Зоригян

Цели и Ваши действия:

Целью данного исследования является изучение взаимосвязи между восприятием и отношением учащихся к сложным задачам, принимая во внимание контекст классной аудитории при формировании такого восприятия, ответы участников будут касаться восприятия своих успехов и неудач, отношения к сложным задачам и реакции на обратную связь. Опрос учащихся, принимающих участие в исследовании, будет проводиться в июне 2019 года в кабинете естествознания, опрос займет около 15-20 минут, после чего в каждой группе будут произвольно выбраны 5 учеников для проведения короткого интервью. Интервью поможет исследователю получить четкое понимание, как занятия в классе помогают учащимся справиться со сложными задачами и переходом в среднюю школу.

Мы планируем провести опрос около 90 добровольцев, а также интервью 5 учащихся из каждого группы.

Риски:

Участие в данном исследовании не несет какими-либо рисков, помимо обычного опыта, когда учащиеся проходят короткий тест в классе. Данные опроса не будут содержать имен учащихся и будут вывезены за пределы школы сразу же после их сбора. Участие в данном исследовании не несет какими-либо рисков, помимо предоставления своих ответов. Данные исследования будут проверены на предмет отсутствия имени Вашего ребенка и любой другой идентифицирующей информации. При анализе данных мы будем использовать исключительно секретный код. Анализ данных будет проводится вместе с данными опроса учеников из других школ и районов, при этом нет никакой возможности идентифицировать ребенка или школу в любой публикации или отчете.

Преимущества:

Информация, предоставленная Вашим ребенком для участия в опросе, поможет лучше понять, какие воспитательные методики и взаимодействия с учителем помогают шестиклассникам справляться со сложными задачами. При использовании в более широких масштабах, результаты могут помочь нам создать такую среднюю школу, которая будет предоставлять более эффективную поддержку юным учащимся.

Конфиденциальность:

Информация, предоставленная Вашим ребенком для участия в опросе, не подлежит передаче любой другой организации, носит конфиденциальный и частный характер. Данные, которые относятся к Вашему ребенку и школе, не будут идентифицированы. Информация, полученная во время интервью, будет собрана методом записи. Данные записи будут удалены сразу же после их расшифровки и проверки участника. Вся другая

информация, которая относится к исследованию, будет храниться в безопасности на протяжении 3 лет, после чего будет удалена. Единственное исключение составляют сообщения о жестоком или небрежном обращении, которое вызывает у нас серьезную обеспокоенность за здоровье и безопасность людей.

Право на отказ от участия:
Ваше участие в исследовании является очень ценным для нас, и мы понимаем, что информация, касающаяся обучения, может быть личной. У Вас есть право в любой момент принять решение не продолжать или отказаться от своего участия в исследовании. Любой вопрос(ы), на который Вы не хотели бы отвечать, может быть пропущен.

Контактная информация:
Вы получите копию данного бланка согласия. В случае возникновения каких-либо вопросов, Вы можете направить их ответственному исследователю на электронный адрес [redacted]. Если Вы хотите связаться с другим нашим представителем, помимо исследователя, Вы можете позвонить или написать директору Образовательного наблюдательного совета, доктору ОраЛи Бранчу (и-мейл: obranch@cu-portland.edu телефон: 503-493-6390).

Заявление о согласии:
Я ознакомился (-ась) с информацией, приведенной выше. Я задал (а)возможные вопросы и получил (а) ответы на них. Предоставляю свое согласие на участие в данном исследовании

_____	_____
Имя участника.	Дата
_____	_____
Подпись участника	Дата
_____	_____
Имя исследователя	Дата
_____	_____
Подпись исследователя	Дата

Исследователь: Чери Киннерсли; и-мейл: [redacted]
Под руководством: Профессор Доктор Белль Букер-Зоригян;
Университет Конкордия – Портленд
2811 Северо-восток, Холман стрит
Портленд, Орегон 97221

FORMULARIO DE CONSENTIMIENTO

Título del estudio de investigación: El efecto de las interacciones en el salón de clases y las prácticas de enseñanza sobre el desarrollo del modo de pensar y la actitud de los estudiantes hacia los retos

Investigador principal: Cherie Kinnersley

Institución de la investigación: Universidad Concordia – Portland

Asesor de la Facultad: Dr. Belle Booker-Zorigian

Objetivo y qué se realizará:

El objetivo de este estudio es examinar la relación entre el modo de pensar y la actitud del estudiante hacia los retos, tomando en consideración al mismo tiempo el contexto del salón de clases en ese desarrollo del modo de pensar, las respuestas de los participantes atenderán el modo de pensar sobre el crecimiento y el fracaso, su actitud hacia los retos y la respuesta a los comentarios de devolución. Se aplicará una encuesta en jeptembre de 2019 a los estudiantes que participen en su clase de ciencia, los estudiantes deberían tomar 15-20 minutos para responder la encuesta y, a continuación, una breve entrevista para 5 estudiantes seleccionados aleatoriamente en cada sede. Esta entrevista le permitirá al investigador obtener una visión interna de las experiencias de los estudiantes en el salón de clase que les ayudarán con los retos y la transición a la escuela media. Esperamos aplicar la encuesta a aproximadamente 90 voluntarios, y entrevistar a 5 en cada sede.

Riesgos:

No hay riesgos por participar en este estudio más allá de la experiencia normal que tienen los estudiantes cuando realizan una prueba en clase. Las encuestas se recogerán sin nombres, y serán removidas de la escuela inmediatamente después de la recolección de las encuestas. No hay riesgos por participar en este estudio distinto de proporcionar sus respuestas. Cuando revise los datos, ningún dato tendrá el nombre ni la información de identificación de su hijo. Solamente utilizaremos un código secreto para analizar los datos. Los datos serán analizados con los datos de otras escuelas y distritos, y no habrá ninguna manera para que una persona identifique al niño o a la escuela en una publicación o reporte.

Beneficios:

La información que su hijo proporciona mediante su participación en la encuesta ayudará a conseguir un mejor entendimiento sobre las estrategias de enseñanza y las interacciones con los maestros que ayudan a los estudiantes de 7° grado a sentirse cómodos con los retos. Utilizado a gran escala los resultados pueden ayudarnos a crear escuelas de enseñanza media que brinden un mejor apoyo a los jóvenes estudiantes.

Confidencialidad:
La información que su hijo proporciona mediante su participación en la encuesta no será distribuida a ninguna otra agencia y se mantendrá de manera privada y confidencial. Los datos específicos de su hijo y de la escuela no serán identificados. La información compartida en las entrevistas será recabada a través de grabaciones. Estas grabaciones serán eliminadas inmediatamente después de su transcripción y verificación por un miembro del equipo. Todos los otros materiales relacionados con el estudio se mantendrán de manera segura por 3 años, y luego serán destruidos. La única excepción a lo anterior es si usted nos informa sobre un abuso o negligencia que nos genere una preocupación seria por su salud y seguridad inmediata.

Derecho para retirarse:
Apreciamos mucho su participación en el estudio y reconocemos que las preguntas pueden ser de naturaleza personal sobre el aprendizaje. Tendrá libertad en cualquier momento para elegir no participar o detener la encuesta. Ellos pueden omitir una o más preguntas que usted no quiera responder.

Información de contacto:
Usted recibirá una copia de este formulario de consentimiento. Si tiene preguntas, puede escribir al investigador principal a su correo electrónico [redacted]. Si desea conversar con un defensor del participante distinto del investigador, puede escribir o llamar al director de nuestra junta de revisión institucional, Dr. OraLee Branch (correo electrónico obranch@cu-portland.edu o llamar al 503-493-6390).

Su declaración de consentimiento:
Leí la información anterior. Hice preguntas si las tuve, y mis preguntas fueron respondidas. Otorgué mi consentimiento voluntariamente para este estudio.

_____	_____
Nombre del participante	Fecha
_____	_____
Firma del participante	Fecha
_____	_____
Nombre del investigador	Fecha
_____	_____
Firma del investigador	Fecha

Investigador: Cherie Kinnersley; correo electrónico: [redacted]
c/o: Profesor Dr. Belle Booker-Zorigian;
Universidad Concordia – Portland
2811 NE Holman Street
Portland, Oregón 97221

Appendix B: Letter of Assent

Dear Student,

I am conducting a research study on how interactions and instructions in your classrooms help you develop as a learner. If you decide to be part of this study, you will be asked to participate in a survey and possibly an interview. The surveys will be conducted at school during your science class and the interviews during class, after school, or during lunch, depending on what is most convenient for you.

There are some things you should know about this study. Your name will not be revealed in the study, but I will be asking you questions about how you feel about your classes and the way you learn. Once I have completed the study, I will write a report about the findings. This report will not include your name or mention that you were part of the study. The information will be published in the hope that it will help teachers and schools do a better job understanding the academic needs and desires of gifted students. It may even help our school do a better job in the future of educating students like yourself.

The information shared in interviews will be gathered through recording. These recordings will be deleted immediately after transcription and member-checking. All other study-related materials will be kept securely for three years and will then be destroyed. The only exception to this is if you tell me about abuse or neglect that makes me seriously concerned for your immediate health and safety.

You do not have to participate in this study, and not participating will not affect your grade, your relationship with me as your teacher, or anything else you do at school. If you decide to stop after we begin, that is okay too.

If you decide you want to be in this study, please sign your name.

I, _____, want to be in this research study.

_____ _____
(Sign your name here) (Date)

Thank you for your attention in reading this form and your consideration of whether or not to participate in this study.

_____

Cherie Kinnersley
Email: [redacted]
c/o: Dr. Booker-Zorigian
Concordia University–Portland
2811 NE Holman Street
Portland, Oregon 97221

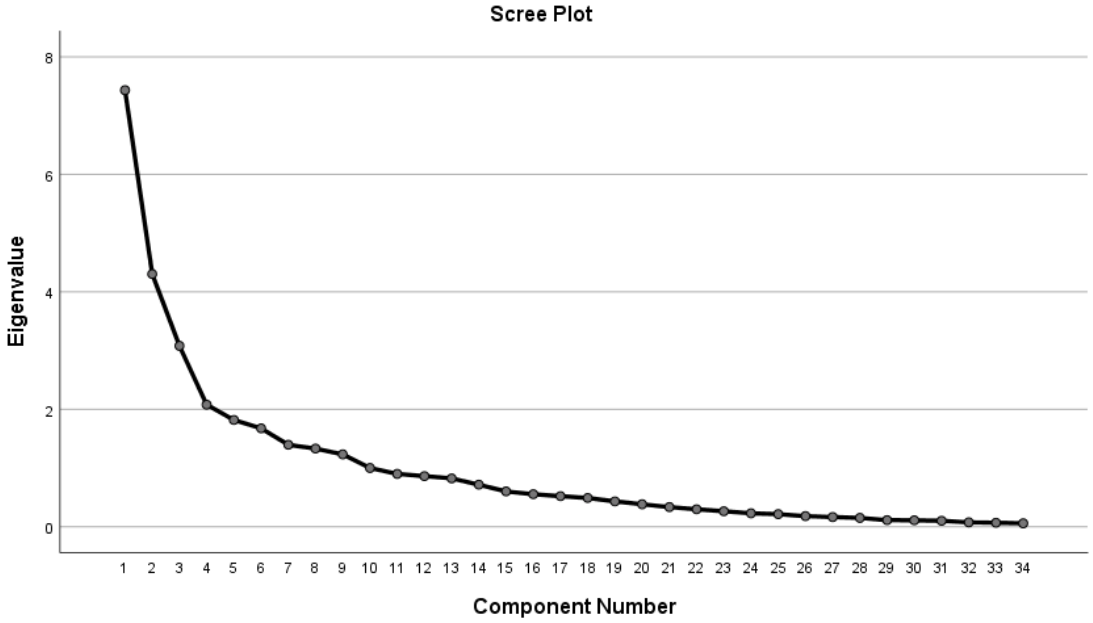
Appendix C: Interview Protocol

Interview introduction: My name is Cherie Kinnersley. You completed my survey in _____'s class. First, thank you very much for doing so. I would like to ask you a few questions if that is okay with you (pause for response). When answering the questions there are no right or wrong answers, just what does or does not work for you and your learning. When answering the questions, you can include examples from this year or 6th grade. If something does not make sense let me know and I will clarify. Do you have any questions? (pause). My first question is…

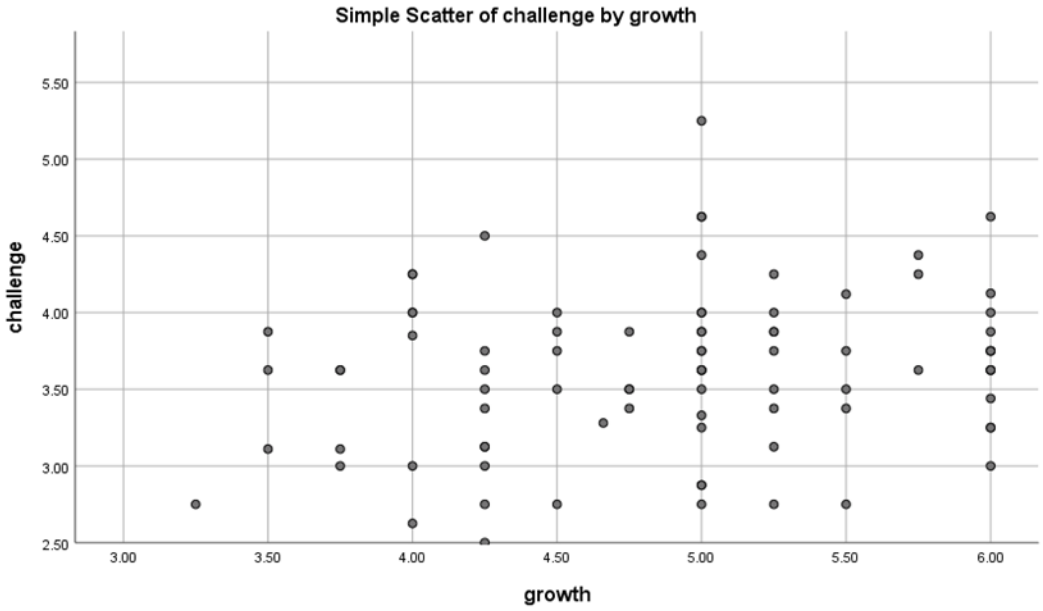
Guiding questions

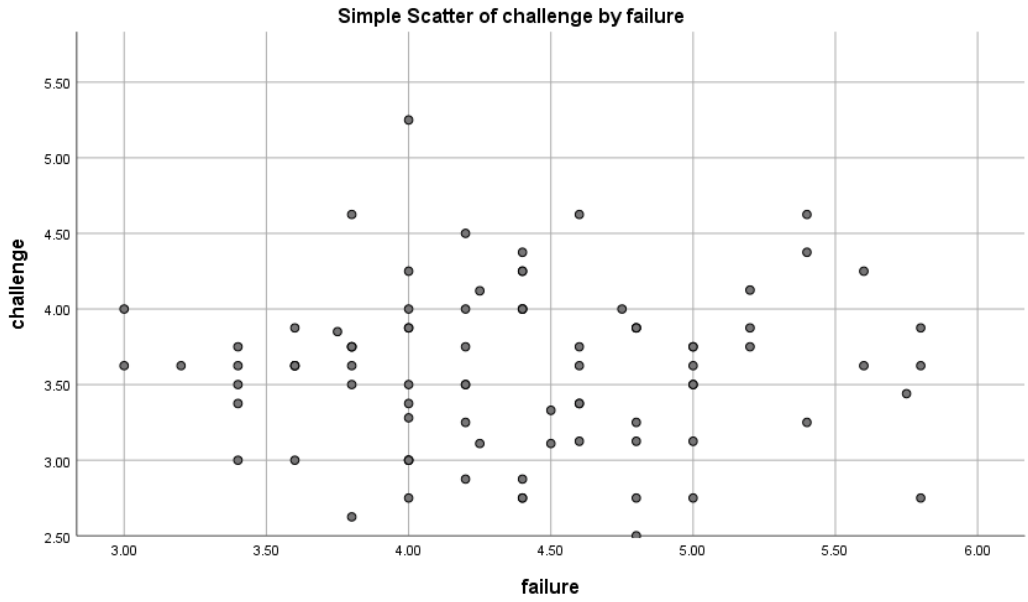
1. What are some of the classroom activities that help you take on a hard challenge?
2. What are some of the ways that your teacher helps you overcome an obstacle?
3. What are some classroom activities that make you feel like you can work hard and learn from a mistake?
4. How does your teacher give you feedback on your work?
5. Describe a time that feedback allowed you to overcome a challenge.
6. Describe how you gain feedback from students in your class.
7. How does your teacher help you think about your learning and help you identify the next steps?
8. What are things that your teacher could do to make it easier to take on a learning challenge and learn from mistakes?
9. What ways does your teacher evaluate your work that helps you continue learning?
10. How does your teacher help you evaluate your own learning?
11. Which classroom activities does your teacher include in class that helps you take ownership of your learning?
12. Describe a time the teacher said something that made you take ownership of your learning?

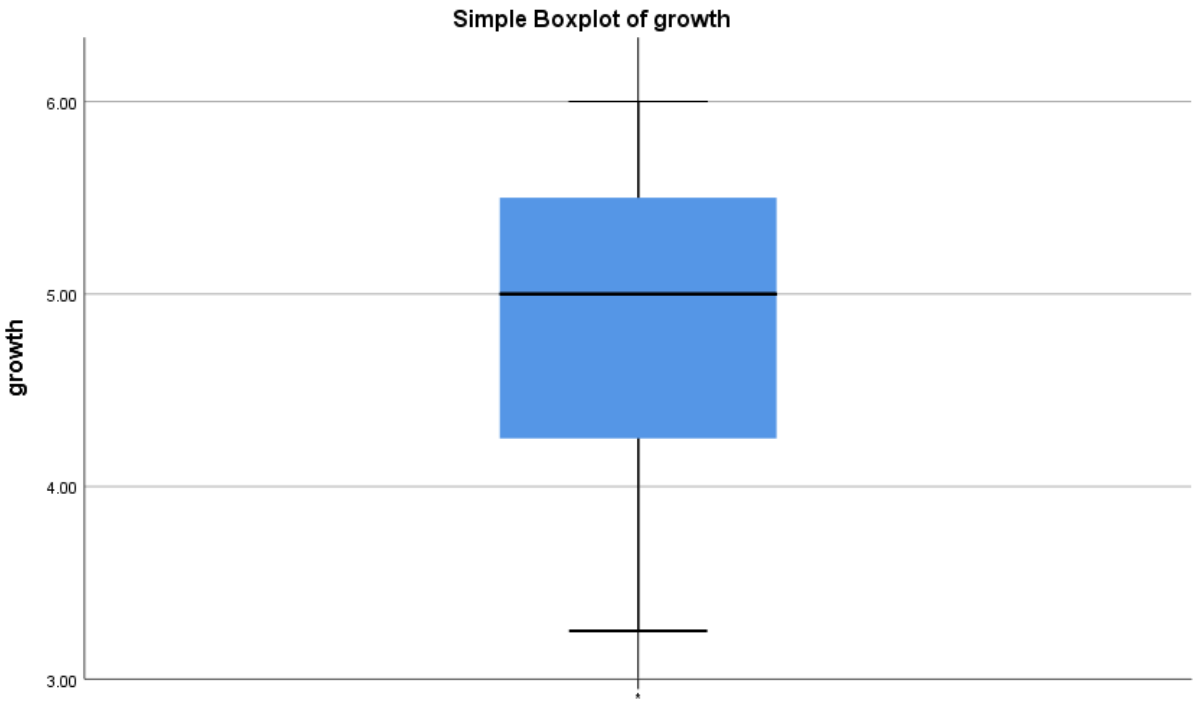
Appendix D: Scree Plot

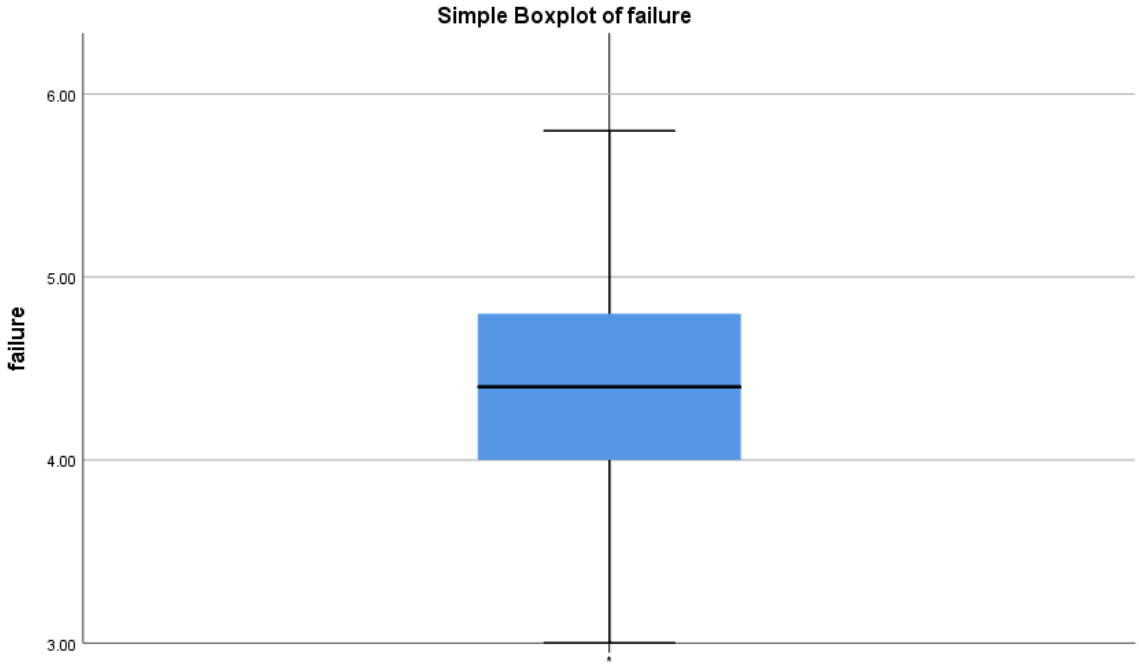


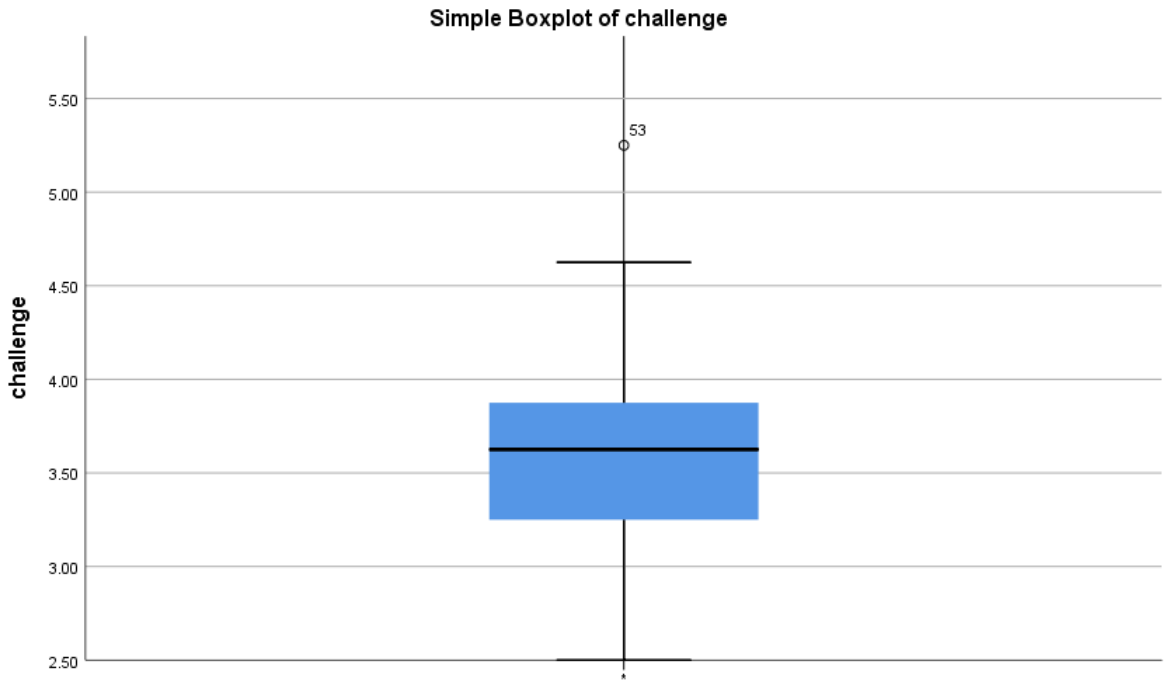
Appendix E: Scatter plots and Box plots



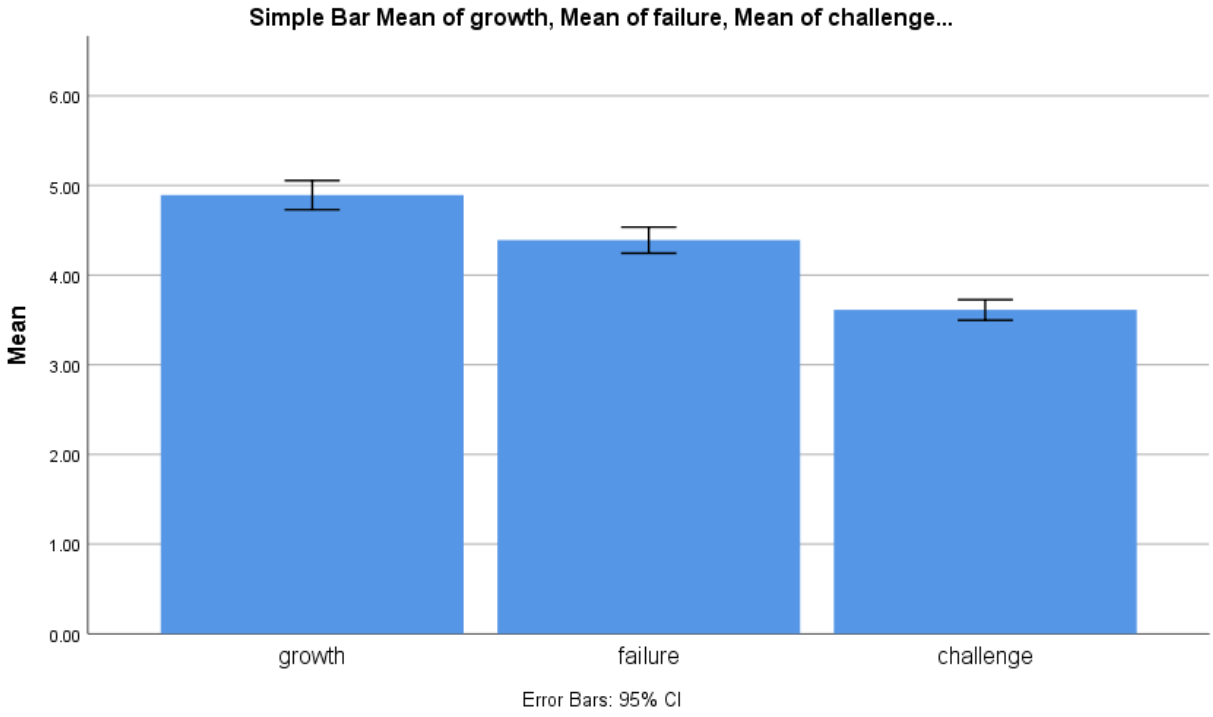



Simple Boxplot of growth
growth
6.00
5.00
4.00
3.00


Simple Boxplot of failure
failure
6.00
5.00
4.00
3.00


Simple Boxplot of challenge
challenge
5.50
5.00
4.50
4.00
3.50
3.00
2.50
53

[


Simple Bar Mean of growth, Mean of failure, Mean of challenge...
Mean
6.00
5.00
4.00
3.00
2.00
1.00
0.00
growth
failure
challenge
Error Bars: 95% CI

Appendix F: Statement of Original Work

The Concordia University Doctorate of Education Program is a collaborative community of scholar-practitioners, who seek to transform society by pursuing ethically-informed, rigorously- researched, inquiry-based projects that benefit professional, institutional, and local educational contexts. Each member of the community affirms throughout their program of study, adherence to the principles and standards outlined in the Concordia University Academic Integrity Policy. This policy states the following:

Statement of academic integrity.

> As a member of the Concordia University community, I will neither engage in fraudulent or unauthorized behaviors in the presentation and completion of my work, nor will I provide unauthorized assistance to others.

Explanations:

What does "fraudulent" mean?

> "Fraudulent" work is any material submitted for evaluation that is falsely or improperly presented as one's own. This includes, but is not limited to texts, graphics and other multi-media files appropriated from any source, including another individual, that are intentionally presented as all or part of a candidate's final work without full and complete documentation.

What is "unauthorized" assistance?

> "Unauthorized assistance" refers to any support candidates solicit in the completion of their work, that has not been either explicitly specified as appropriate by the instructor, or any assistance that is understood in the class context as inappropriate. This can include, but is not limited to:
>
> - Use of unauthorized notes or another's work during an online test
> - Use of unauthorized notes or personal assistance in an online exam setting
> - Inappropriate collaboration in preparation and/or completion of a project
> - Unauthorized solicitation of professional resources for the completion of the work.

Statement of Original Work (Continued)

I attest that:

1. I have read, understood, and complied with all aspects of the Concordia University–Portland Academic Integrity Policy during the development and writing of this dissertation.

2. Where information and/or materials from outside sources has been used in the production of this dissertation, all information and/or materials from outside sources has been properly referenced and all permissions required for use of the information and/or materials have been obtained, in accordance with research standards outlined in the *Publication Manual of The American Psychological Association.*

Cherie Kinnersley

Digital Signature

Cherie Kinnersley

Name (Typed)

3-23-20

Date