

MIDDLE SCHOOL STUDENT VOICES ON THE FUNCTION AND UTILITY OF A
“LEARNING HOW TO LEARN” COURSE IN A RURAL MIDDLE SCHOOL: A
MIXED-METHODS STUDY

by

Beth Hosek
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Course in a Rural Middle School: A Mixed-Methods Study

A Thesis submitted in partial fulfillment of the requirements for the degree of Master of
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by

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Dedication

This one's for me.

Acknowledgements

The completion of this project was possible due to the great support of the community around me. Most directly, this includes the support of my advisor, Dr. Anastasia Kitsantas, and the guidance of the other members of my committee, Dr. Shannon King, Dr. Jung Yeon Park, and Dr. Roy Echeverria. The further academic and professional growth that Dr. Stephanie Dailey fostered in me also helped me reach this goal. It also goes without saying that achieving this goal would not have been possible without the support of the school district referred to in this thesis, and I want to profusely thank the students, families, teachers, administrators, and principal for making this possible. My peers, friends, and family were also instrumental in helping me climb this mountain and keep my head on straight while doing so. More than anyone else, my greatest supporters have been Scott, Dana, Kayla, Matthew, Ben, and my parents Tim and Donna.

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List of Abbreviations and/or Symbols

Analysis of Variance.....	ANOVA
English Language Learner	ELL
Structural Equation Modeling.....	SEM
Student-Led Assessment.....	SLA
Self-Regulated Learning	SRL

Abstract

MIDDLE SCHOOL STUDENT VOICES ON THE FUNCTION AND UTILITY OF A “LEARNING HOW TO LEARN” COURSE IN A RURAL MIDDLE SCHOOL: A MIXED-METHODS STUDY

Beth Hosek, M.S.

George Mason University, 2021

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The purpose of this study is to explore the voices of high- and low-achieving middle school students around how a student-led assessment (SLA), “learning how to learn” intervention fosters achievement goal orientations and self-efficacy for self-regulated learning (SRL). Participating students included 99 seventh- and eighth-grade students from a rural middle school enrolled in the SLA intervention. This intervention involves teaching students how to become independent learners. Self-report measures were administered and focus groups occurred during the fourth quarter of the academic year. Data analysis revealed no significant differences between high- and low-achieving students regarding their goal orientations, as well as self-efficacy for SRL. During the focus groups, students provided information about the function of the learning how to learn course and voiced the utility of the intervention for improving their study skills. It was also found that, in contrast to high-achieving students, low-achieving students

expressed the need for increased support in setting and achieving their learning goals.

Findings have implications regarding future refinement and guidelines for implementation of “learning how to learn” SLA courses in middle schools.

Chapter One: Introduction

Student academic achievement is reliant on motivation, of which two major components are their goals and beliefs (Bandura, 1977). For students to be able to set and work towards goals, as well as establish and utilize their beliefs, they need to be able to self-regulate their learning. This entails students having the ability to think about their own learning, their motivation around learning, and their behaviors with respect to learning. This takes place through three main phases of self-regulated learning: forethought, performance, and reflection (Zimmerman et al., 1992).

Two constructs of particular importance for students to find success when self-regulating their learning are achievement goal orientations and self-efficacy for self-regulated learning (SRL). Achievement goal orientation theory looks at student motivation via how they work on academic tasks using two spectra: the goal spectrum ranges from mastery goals (where students work on the task for the sake of succeeding at the task) to performance goals (where students aim to look competent); the attitude spectrum ranges from approach orientations (where students again work toward a goal for the sake of the goal) to avoidance orientations (where students work toward a goal to avoid failing or to appear competent to others; Rosen et al., 2010). Self-efficacy for SRL focuses on how students view themselves, specifically on their self-perceptions of their ability to regulate their own learning. This includes concepts pertaining to setting goals,

showing self-control during a task such as studying, and afterwards reflecting on the decisions they made while learning (Usher & Pajares, 2008).

These constructs influence the academic achievement of students of all ages (DeCaro et al., 2015; Filippello et al., 2018; Hernandez et al., 2013; Keys et al., 2012; Koul et al., 2012). In general, it has been seen that mastery achievement goal orientations positively impact student achievement and SRL (Hernandez et al., 2013; Phillips & Gully, 1997; Radosevich et al., 2004). In middle school students specifically, mastery goals are predictive of SRL at both the beginning and end of the school year (Wolters et al., 1996). Furthermore, mastery orientations have been observed to positively correlate with academic achievement in middle school students (Keys et al., 2012). Additionally, SRL is important to education because when students believe they can regulate their learning they use these strategies more often, demonstrate increased achievement, and these beliefs correlate with mastery goal orientations (Wolters et al., 1996) as well as achievement (Zuffiano et al., 2013).

Theoretical Framework: Social-Cognitive Theory

Social-cognitive theory dictates that motivation is driven by beliefs, goals, and emotions (Bandura, 1991), and is fostered by social contexts (Schunk & DiBenedetto, 2020). These ideas support SRL, which is made up of three parts: forethought, performance, and reflection. Students use this to develop and work towards their goals (Bandura, 1991; Panadero, 2014). Bandura established that self-efficacy is the most important construct regarding SRL, particularly the forethought phase, by giving learners the tools to control their motivation and behavior (Bandura, 1991; Cook & Artino, 2016;

Panadero, 2014). This in turn impacts the following performance phase, where learners observe themselves and adapt their beliefs, emotions, and goals to continue to improve. This stage is reliant on feedback and assessment (Bandura, 1991).

Within the framework of social-cognitive theory, the social environment plays a strong role in how individuals learn from others. Methods include modeling behavior, successful mastery learning experiences, social persuasion, and physical or emotional responses (Cook & Artino, 2016). The social environment and motivation together provide an individual with a goal hierarchy. Furthermore, social and group comparisons can impact self-concepts, self-efficacy, established goals, and emotions (Bandura, 1991). Agency is also an important component of self-regulation as the ability of the individual to exercise some control over their context is important to motivation and self-regulation (Bandura, 1999; Schunk & DiBenedetto, 2020). Social environments influence the establishment of agency through the learning process and construction of the individual's environment (Bandura, 1999).

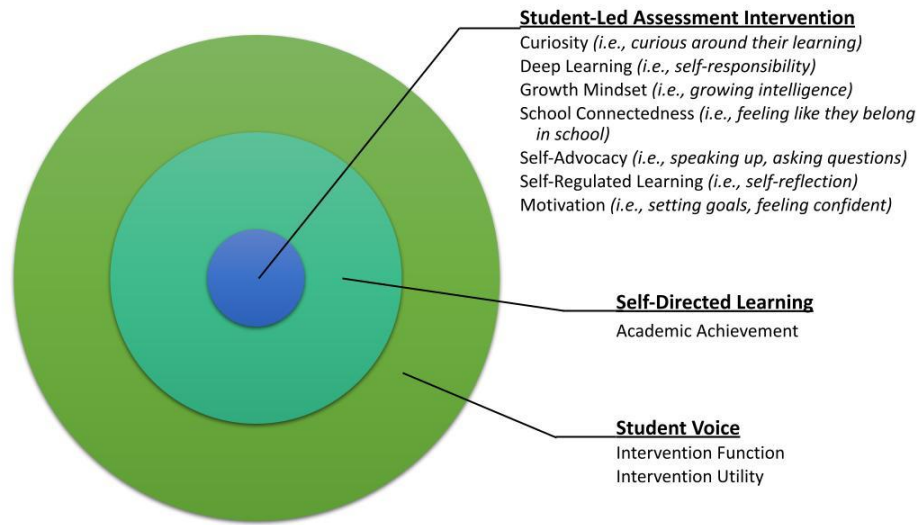


Figure 1

Study Framework: Relationships among the SLA intervention, Self-Directed Learning, and Student Voice and Outcomes

Student-Led Assessment

Student-led assessment (SLA) gives students agency and voice around the method in which they engage in class projects, as well as the administration of feedback to themselves and their peers during these projects. There are several components that make up SLA, and in fact as addressed in Figure 1, can be modeled to include social-cognitive theory, self-directed learning, self-efficacy, growth mindset, and more. This study focuses on seven main core concepts: curiosity, deep learning, growth mindset, motivation, school connectedness, self-advocacy, and SRL (Greenstein & Burke, 2020). These facets were chosen as their integration together during the implementation of SLA courses place

the student and their personal goals at the core of the intervention. With the use of these constructs, the individual student, topics that are personally relevant and intrinsically interesting to them, their needs, and their safety and sense of community are cultivated alongside the voice of the student to allow them to set, work towards, and reflect upon their goals (Andrade, Huff, & Brooke, 2012; Brown & Harris, 2014; Dweck, 2008; Greenstein & Burke, 2020; Hautamaki et al., 2002; James et al., 2007; Steele et al., 2000).

This concept has been studied in graduate and undergraduate university settings, professional and vocational school, as well as K-12 education. This prior research has shown that SLA encourages engagement and SRL skills in students (Harris & Brown, 2013; Sargeant et al., 2010; Walters et al., 2017). In addition, many teachers and students enjoy this method of assessment (Kassab et al., 2005; Vanderhoven et al., 2015) and find it to be effective in communicating the information and improving the quality of the teaching (Colthart et al., 2008; Harris & Brown, 2013).

Some educators and learners have articulated concerns about objectivity of evaluation and impact on interpersonal relationships (Harris & Brown, 2013); however, anonymous assessment alleviated some of these concerns (Vanderhoven et al., 2015). In addition, some students noted that workload and content were more difficult with less educator support through assessments, but the value gained from increased engagement and strengthened interpersonal relationships supported student enjoyment of SLA (Bouw et al., 2015; van Gennip et al., 2010). Furthermore, peer feedback tends to consist of evaluations of learning and suggestions for improvement (Harris et al., 2015), enabling

self-regulation through reflection, and in turn student agency (Casallas & Castellanos, 2016). Despite this understanding of the impact of SLA because most research has been done in higher education, a gap in knowledge exists regarding how SLA operates in K-12 education.

Statement of the problem

It has been clearly established that SRL is vital to the success of students (Bandura, 1991; Cook & Artino, 2016; Panadero, 2014), but most students are not explicitly exposed to instruction on learning and developing these skills until they enter a university setting. Furthermore, when interventions are implemented to cultivate these skills in students prior to college they are found to be effective (Hernandez et al., 2013; Keys et al., 2012; Phillips & Gully, 1997; Radosevich et al., 2004; Wolters et al., 1996; Zuffiano et al., 2013). Unfortunately, these interventions are rare. SLA could be an effective medium to impart younger students, including middle school students, with these skills as SRL is one of the core elements of SLA (Harris & Brown, 2013; Sargeant et al., 2010; Walters et al., 2017). Furthermore, SLA fosters concepts including student beliefs (such as self-efficacy for self-regulated learning) and goals (such as achievement goal orientations), important to student academic motivation (Greenstein & Burke, 2020). That being said, there is a need for such interventions directed at developing these skills in middle school students.

Achievement goal orientations have various available existing interventions. Most, if not all, focus on fostering mastery orientations in students as this type of achievement goal orientation is typically the most advantageous for students and

corresponds to an increase in academic achievement (DeBacker et al., 2018; Lonn et al., 2014; Mupira & Ramnarain, 2018; O’Keefe et al., 2013). Plenty of interventions can be found for college students (Lonn et al., 2014), as well as high school students (DeBacker et al., 2018; Mupira & Ramnarain, 2018; O’Keefe et al., 2013), with fewer interventions being present for elementary school students, and next to no interventions available for middle school students. One study by Patrick and Ryan (2008) did survey middle school students to see what teacher behaviors proved to help and support mastery orientations, and this information could potentially be used to fill this empty niche and develop an effective intervention for middle school students regarding achievement goal orientations.

A similar problem is observed with self-efficacy for SRL, but the issue is even more exaggerated and the void even larger. Most interventions here do seem to focus on high school and middle school students, but this area is very sparse, and few interventions are available (Cleary et al., 2008, 2017; Cleary & Platten, 2013; Kitsantas et al., 2004; Peters & Kitsantas, 2010; Sandhu & Zarabi, 2019). The interventions that are available vary between being fully integrated into an existing class or being a supplementary course to teach relevant skills (Cleary et al., 2008; Cleary & Platten, 2013; Peters & Kitsantas, 2010; Sandhu & Zarabi, 2019). Regardless of their implementation and the grades for which they are implemented, these interventions tend to see increases in self-efficacy for SRL and achievement. This improvement truly emphasizes the need for interventions emphasizing self-efficacy for SRL as early as middle school, rather than waiting for high school or college to foster these concepts in students.

Achievement goal orientations and self-efficacy for SRL are ways of representing the beliefs and goals portions of motivation in students. Because these two motivational facets work together to influence academic achievement, understanding how to effectively foster these constructs in students is an important problem to address. Furthermore, since gaps in the literature seem to be present regarding interventions which foster both constructs in middle school students, investigating and beginning to work in this niche is important to fostering student success during a transitional and impactful developmental period for learners.

Significance of the Study

Current interventions for achievement goal orientations and self-efficacy for SRL do not necessarily place emphasis where it is needed for strong student growth, particularly with regard to their study skills. For instance, achievement goal orientation interventions, while they emphasize mastery mindsets, focus on high school and college students, and do not consider perceptions of middle school students' needs regarding teacher behavior (Patrick & Ryan, 2008). Furthermore, nearly all interventions that focus on self-efficacy for SRL look at high school and college students, with markedly little attention being given to middle school students. This is important to note as older students may have established their mindsets already, but middle school students are undergoing an important stage of cognitive intelligence regarding these two constructs (Eccles et al., 1984; Schunk, 1987). Understanding that middle school is a pivotal time of transition for these constructs, it is therefore vital to develop interventions that attend to achievement goal orientations and self-efficacy for SRL in middle school students to

foster their development and achievement. This SLA intervention might fill this void. This intervention implemented in a rural, mid-Atlantic middle school impacts these constructs and cultivates autonomy in these students as they learn and grow in the realm of study skills. Few middle schools implement such an intervention, making the opportunity to observe and analyze this SLA intervention unique and valuable in terms of learning what tools are useful to foster the constructs in question in middle school students.

Research questions

The purpose of this study was to explore middle school student voices regarding an SLA intervention. In particular, the present goal was to examine the function and utility of the SLA intervention through the eyes of the students. Seventh and eighth grade middle school students' perceptions were examined regarding their mastery and performance-approach achievement goal orientations, as well as self-efficacy for SRL through the use of self-report questionnaires. In addition, high- and low-achieving students participated in focus groups regarding the implementation of the intervention. The following research questions were explored:

Research Question 1

What differences are seen in self-efficacy for SRL, and mastery- and performance-approach goal orientations when comparing high-, moderate-, and low-achieving middle school students exposed to the SLA intervention?

Research Question 2

How do high- and low-achieving middle school students perceive the function and usefulness of the SLA intervention to which they were exposed?

Research Question 2.1. How do high- and low-achieving middle school students exposed to an SLA intervention engage in goal-setting behaviors and perceive the goal orientations they adopt?

Research Question 2.2. How do high- and low-achieving middle school students who were exposed to an SLA intervention use SRL strategies and describe their self-efficacy beliefs regarding using these strategies?

Definition of Terms

Achievement Goal Orientations

Achievement goal orientation theory frames motivation from the perspective of how a student aims to show their competence and mastery of academic tasks. This approach involves types of goals spread on a spectrum from mastery to performance and attitudes divided on a spectrum of approach to avoidance. Generally, mastery goals and approach attitudes are more advantageous for students than performance goals and avoidance attitudes. (Rosen et al., 2010).

Curiosity

Curiosity utilizes the student and those concepts that have inherent personal relevance to fuel the intrinsic interest of the learner (Andrade, Huff, & Brooke, 2012). Curiosity can be observed in students when noting certain ideas; this notably includes persistence with respect to academic tasks, inquiring about concepts, information recall,

deeply processing presented information, seeking academic challenges, and maintaining attention on the academic task at hand (Weible & Zimmerman, 2016).

Deep Learning

Deep learning experiences involve student utilization of agency and learning skills to respond to academic task prompts. Such experiences involve personal relevance to students, as well as sharing of knowledge and reflection on academic growth at the conclusion of the academic task (James et al., 2007).

Growth Mindset

Growth mindset refers to how students perceive and think about their intelligence. Students who find motivation when observing others' success, use feedback to grow and learn, use effort to achieve their goals, persist despite setbacks, and pursue challenge are seen to have a growth mindset. Those students who perceive a threat when others succeed, see receiving feedback as a negative experience, do not think expending effort is worthwhile, do not persist through obstacles, and avoid challenge are seen to have a fixed mindset. Typically, growth mindsets are more beneficial for students than fixed mindsets (Dweck, 2000, 2008).

Mastery Goal Orientation

Mastery achievement goal orientations are demonstrated by students when they aim to become competent at a skill or task. This achievement goal orientation is demonstrated by the student when they aim to master an academic task purely for the sake of the task itself. (Rosen et al., 2010).

Performance Goal Orientation

Performance achievement goal orientations are demonstrated by students when they value demonstration of competence to others. When completing a task or learning a skill, they are not concerned with mastery of the task, but instead have the goal of looking capable in the eyes of teachers or peers. (Rosen et al., 2010).

Motivation in Social-Cognitive Theory

Social-cognitive theory discusses how learner motivation is founded upon beliefs, goals, and emotions (Bandura, 1991), and is fostered by social contexts to promote SRL (Schunk & DiBenedetto, 2020). Self-efficacy has a strong influence on SRL skills, giving learners the tools to control their motivation and behavior when performing at a task (Bandura, 1991; Cook & Artino, 2016; Panadero, 2014), during which feedback and assessment allow students to adapt their beliefs, goals, and emotions for growth (Bandura, 1991).

School Connectedness

School connectedness refers to the senses of safety, fair treatment, community inclusion, and closeness students experience in their school, as well as their feelings of happiness at their school (McNeely et al., 2002). Feeling safe and connected to the learning community fulfills student needs, allowing them to work towards their goals and create a sense of personal achievement (Greenstein & Burke, 2020).

Self-Advocacy

Student self-advocacy refers to students reflecting and understanding their needs, and subsequently speaking up and using their voice to obtain the tools and resources they need to meet their learning goals (Greenstein & Burke, 2020). This may include concepts

such as students persuading and directing others of their opinion and needs, suggesting ideas and providing criticism during tasks; as well as supporting and encouraging others and requesting support and encouragement for themselves (Wang et al., 2009).

Self-Regulated Learning

Self-regulated learning (SRL) as defined here in this study is based upon social-cognitive theory. It involves three phases: the first looks at student forethought and how they break down and plan tasks, as well as the incorporation of student beliefs; the second phase is defined by student performance on the task and how the student uses metacognitive processes, including self-control, to work through the task; and the third and final phase is self-reflection and involves student analysis of their own performance on the task after it is completed. (Rosen et al., 2010).

Self-Efficacy for Self-Regulated Learning

Self-efficacy for self-regulated learning (SRL) is based on a student's self-perceptions. It focuses on how well a student thinks they can make decisions about regulating their learning, such as setting goals, showing self-control, and reflecting on their decisions (Usher & Pajares, 2008).

Student-Led Assessment

Student-led assessment (SLA) gives students agency over the method and administration of feedback to themselves and their peers and encourages engagement and SRL skills in students. SLA has seven main components examined in the context of this study and outlined in prior literature on the concept: curiosity, deep learning, growth

mindset, motivation, school connectedness, self-advocacy, and SRL (Greenstein & Burke, 2020).

Chapter Two: Literature Review

Introduction

Achievement goal orientations and self-efficacy for SRL are both fundamental to the long-term achievement of students of all ages (DeCaro et al., 2015; Filippello et al., 2018; Hernandez et al., 2013; Keys et al., 2012; Koul et al., 2012). The definitions of these constructs illuminate why this is true and vital to student learning skill.

Achievement goal orientations relate to how well a student wishes to perform academically; this desire is founded on cognition, emotion, and task value. Orientations can be placed on two axes: the mastery-performance axis, and the approach-avoidance axis. Mastery orientations focus on achievement for the sake of the task; performance goals focus on achievement for a competent external appearance. On the other axis, approach goals aim to attain a goal for the sake of the goal; avoidance goals are set to avoid the appearance of incompetence (Rosen et al., 2010). The definition of self-efficacy for SRL can be inferred from the construct's name itself: it deals with to what degree a student believes that they can make decisions about regulating their learning, such as setting goals (Usher & Pajares, 2008).

This literature review is presented with the purpose of exploring the following: First, a foundation in social-cognitive theory will be established. Next, an overview of the relevant constructs (achievement goal orientations and self-efficacy for SRL) will be covered, as well as what interventions are currently available for both constructs. This will be followed by a summary of SLA and current interventions. Finally, this literature

review will end with a discussion of limitations present within the scope of the literature review, recommendations for future research that emerged from an analysis of the literature, and an overview and description of the relevance of the present study.

Social-Cognitive Theory

Motivation is what supports student action and effort toward establishing and meeting goals (Schunk & DiBenedetto, 2020). Social-cognitive theory, as established by Bandura, is indicative of motivation being centralized around beliefs, goals, and emotions (Bandura, 1991). This approach emphasizes how social contexts influence these components of motivation, and the interplay between these components. Beliefs impact goals and emotions, emotions impact goals and beliefs, and goals impact beliefs and emotions. Furthermore, a similar interaction can be observed between thoughts, actions, and environment. (Schunk & DiBenedetto, 2020).

These components provide a foundation for SRL. SRL, as established by Zimmerman, has three components: forethought, performance, and reflection. SRL is a tool for students to approach their goals; it impacts their goal orientations and learning strategies in the classroom (Bandura, 1991; Panadero, 2014). The forethought phase is impacted by self-beliefs, particularly self-efficacy (Panadero, 2014). Self-beliefs provide the individual with control over their motivation and behavior (Bandura, 1991). Self-efficacy specifically is core to motivational control and SRL behavior as it is based upon past performance and allows the learner to ask themselves in a context-specific manner if they are capable of completing the academic task at hand (Cook & Artino, 2016).

Once self-efficacy beliefs established the planning phase of SRL, the learner proceeds into the performance phase; during this phase they engage in self-monitoring and self-observation. This process influences how successful a learning is when attempting a task and gives the individual the tools to update their self-beliefs. Self-observation as a component of social-cognitive theory gives the individual a tool to develop and adapt their learning goals over time based on progress. Performance monitoring provides sustained motivation for the learner to work towards their goal; feedback which provides clear direction and demonstrates some progress supports motivation. This motivation and self-feedback are positively correlated, with individuals who are motivated giving themselves better feedback, and those who give themselves better feedback experiencing more motivation (Bandura, 1991).

Self-monitoring is important to self-improvement. Individuals must be able to observe their own behaviors to change their behaviors. This concept is important for students to be able to meet their goals, establish their self-beliefs, and set standards. Negative and positive feedback are both important during the self-observation process for learner growth and progression in motivation; it allows for a discrepancy between standards and performance and promotes growth to reduce that discrepancy, as well as allowing for the individual to proactively act and react to feedback. Emotions also provide support for motivation during this phase. When the individual feels good about their performance they want to continue to engage in the task, but when they do not perform well or feel positively about their performance, they may use that as motivation to improve (Bandura, 1991).

Social-cognitive theory focuses on learning from and observation of others. Modeling, successful or mastery experiences, social persuasion, and physical and emotional responses are ways the social environment influences self-efficacy (Cook & Artino, 2016). Social modeling teaches the foundations of skills and ideas and allow learners to build personalized behaviors and apply concepts personally (Bandura, 2005). Furthermore, social modeling can promote creativity and innovation in students, and support learning (Bandura, 2003; 2005).

Typically, motivation can be seen to provide an individual with a hierarchy to their goals, where a high need for achievement relates to a high level of goal setting (though not necessarily performance), and the performance that does come about from those goals can impact the individual's standards for performance. However, a learner's social environment can also establish this hierarchy of goals based upon social persuasion and modeled behaviors. Group comparisons, both between and within groups, also socially establish how people view themselves, set goals for themselves, and feel about themselves. Social comparison can also both help and hinder self-beliefs, the development of goals, and their related emotions (Bandura, 1991).

Bandura also noted that individual agency is important to the self-regulation of the individual. Behavior, biology, cognition, emotion, and the environment all work together to support this agency (Bandura, 1999; Schunk & DiBenedetto, 2020). Social-cognitive theory dictates that social systems also influence individual agency; this is done through observational learning and modeling, as well as socially established values (Bandura, 1999). These social systems are connected to the environment the individual

finds themselves in, and those different environments can be directly related to differing levels of agency. From least to most amount of agency, some environments may be forced upon the individual, some may be chosen by the individual, and some environments are created by the individual (Bandura, 1999).

Taken as a whole, social-cognitive theory outlines how an individual's beliefs, goals, and emotions influence their ability to be motivated to learn, particularly regarding self-regulation. The social context and environment play a large role in how these factors of motivation are established. Modeling and social persuasion, in particular, foster self-efficacy. Educators can implement these ideas in the classroom to foster student success. Furthermore, with developments in technology and online media, educators and learners can use a more highly interconnected global social environment to foster more well-rounded learning environments (Bandura, 2003).

Achievement Goal Orientations

Achievement goal orientations take many forms: most studied are mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance orientations. Typically, mastery-approach orientations are the most adaptive orientations for students as they relate to students working on a task due to the activity's inherent value. Performance-avoidance orientations are viewed as the least adaptive with students possessing these goals engaging in tasks to avoid appearing incompetent. The applicability and use of performance-approach and mastery-avoidance orientations seem to be highly contextual. These orientations are moderated by the environment: a 2016 study by Skaalvik and Federici found that the degree of mastery goals set in a classroom

and is moderated by the degree of performance goals also set in the same classroom, regardless of grade level.

The construct of achievement goal orientations has been widely studied in college students. Generally, achievement goal orientations have not been found to change over time (Nerstad et al., 2019) and mastery orientations are generally the most beneficial to student participation, SRL, and achievement (Hernandez et al., 2013; Phillips & Gully, 1997; Radosevich et al., 2004). Varying results have been seen regarding performance orientations. Some studies have found performance goals overall negatively correlated with self-efficacy (Phillips & Gully, 1997), whereas some have found performance-approach goals beneficial to engagement and achievement and performance-avoidance goals detrimental (Hernandez et al., 2013). Another study found a negative correlation with performance-approach and avoidance orientations and GPA (D'Lima et al., 2014). Finally, performance goals have even been found to be connected to student anxiety (Daniels et al., 2008). It is clear that with college students, the impact of mastery goal orientations is decidedly beneficial, performance goal orientation influences are inconsistent with respect to how beneficial they are.

Just as with college students, similar results have been seen in high school students: mastery goals are correlated with achievement, with females having more mastery orientations than males, and males having more performance orientations than females (Filippello et al., 2018; Koul et al., 2012; Sins et al., 2008). Interestingly, when compared to college students, one study found college students may have higher levels of mastery orientations than high school students (Martin et al., 2008). Achievement goal

orientations in high school students have also been shown to be stable across race (Harper, 2010). Some studies have shown data that conflict with the above—such as performance goals correlating with GPA (Chen & Wong, 2015) and students who receive extrinsic rewards for performance doing better on a worksheet than those with mastery goals (McWhaw & Abrami, 2001)—so it would be logical to conclude that more investigating into performance goals is warranted, and in contrast the value of mastery goals is well established.

Achievement goal orientations have also been explored in elementary school. Some results are similar to what is seen across development: one study found the classroom goal structures and student achievement goal orientations matched and were positively correlated (Shannon et al., 2012), and another found mastery goals were positively correlated with the use of complex cognitive strategies (DeCaro et al., 2013, 2015). Other results are very different; for instance, in a study looking at 11- and 12-year-old students, all achievement goals were intercorrelated, demonstrating a lack of differentiation at this age (Putwain & Daniels, 2010). Another study found, while mastery and performance goals were related to performance on the SOL, and relationships were seen between achievement goal orientations and SRL, mastery goal orientation did not predict achievement (Kitsantas et al., 2009).

Seeing that there are differences between the impact of achievement goal orientations in elementary and high school students could indicate that middle school is a time of transition achievement goal orientations. A 1997 study by Anderman and Midgley investigated this by surveying 341 students at six suburban schools in the U.S.

Midwest, once in 5th grade, and again in 6th grade. Data collected included survey data from the PALS (separately for English and Math), and students were divided into high- and low-ability groups depending on their score on the Cognitive Test of Basic Skills. They found a correlation between math and English achievement goals in 5th and 6th grade (so students likely had a similar orientation for both subjects). Subject achievement goals were not correlated before and after the transition, and classroom orientations were negatively correlated over the transition. Females were more task oriented in English, but task orientations generally decreased after the transition, whereas males had higher performance orientations overall; both males and females across grades had greater performance goals in math. Sixth grade had fewer task goals than 5th grade, but English still had more task goals than math. Low-ability students reported more of a task goal emphasis in class than high-ability students. However, low-achieving, male, and 6th grade students all reported more performance goals in class. This would seem to indicate that as students transition to middle school, they place more emphasis on and perceive more emphasis on performance goals over mastery goals, that this impact is less so for English and for females and increased for low achieving students (Anderman & Midgley, 1997).

These conclusions are important as middle school is the population of interest for this study. In this population, mastery goals have been shown to predict task value, self-efficacy, cognitive strategies, and SRL at the beginning and end of the school year, and performance goals have been shown to be correlated with motivation, cognition, and performance at these time points as well (Wolters et al., 1996). Clearly in this population,

achievement goals have wide-ranging impact. Other studies have also shown mastery orientations positively correlating with achievement in middle school students alongside a negative correlation between performance-avoidance goals and achievement (Keys et al., 2012). A 2019 study took this a step further and demonstrated that parental care could influence this subsequent goal orientation, and in turn, achievement (Jozsa et al., 2019). Furthermore, a study in rural schools demonstrated that when students perceive their classroom as having a mastery-oriented culture, and students also possess personal mastery orientations, these two orientations—personal and contextual—were positively correlated and built off each other (Freeman & Anderman, 2005); similar concepts have been observed for performance orientations (Dewi & Mangunsong, 2012). Therefore, based upon the impact goal orientations have in various middle school contexts, as well as how this construct is characterized before and after this time period in development in students, not only does middle school seem to be an important time of transition for achievement goal orientations, but context and environmental factors also play an important role in cultivating adaptive goal orientations.

Socio-Economic Status

Achievement goal orientations have been widely studied in the realm of socio-economic status, and this is relevant as the school examined is in a low-income, rural area and has a number of students classified as disadvantaged. For the most part, results seem to indicate that students with higher socio-economic status report higher levels of mastery orientations, and students with lower socio-economic status report lower levels of mastery orientations. Take, for example, a 2016 study by Berger and Archer: after

analyzing survey data from high school students, they found students with high socio-economic status reported more mastery goals, and similar patterns were seen in performance goals, both approach and avoidance (though the difference was smaller across socio-economic status in performance-avoidance goals); students in higher socio-economic status had more achievement goal orientations in general (Berger & Archer, 2016). The researchers followed this survey up with a 2018 qualitative study investigating this phenomenon: students with low socio-economic status were more strongly performance oriented, with an emphasis on performance-avoidance orientations. In other words, these students wanted to avoid the social appearance of having failed academically to others based on standardized exams that they would be experiencing. Students with high socio-economic status appeared to have both mastery and performance goals, with an emphasis on performance-approach goal orientations—a more adaptive mindset (Berger & Archer, 2018).

Other studies have found similar interactions between socio-economic status and achievement goal orientations. Research in 6th grade students showed higher socio-economic status was related to higher achievement. Furthermore, mastery orientations had the best achievement scores, whereas avoidance orientations had the lowest achievement, and goal orientation was found to have a greater impact on math achievement than socio-economic status (Lin et al., 2009). Another study in Filipino high school students showed significant differences between low and high socio-economic status groups in achievement goals, including mastery and performance goals, with high socio-economic status students having higher levels of achievement goals across the

board (Bernardo et al., 2015). Finally, a study in French university students found that, when a mastery learning environment or activity was presented, the achievement gap between socio-economic status was eliminated; however, when a mastery condition was not present, students with higher socio-economic status obtained higher levels of achievement than students with low socio-economic status (Smeding et al., 2013).

Not all studies have found these results, however. For instance, a large study in German middle school students found no differences between mastery orientation, self-efficacy, and other motivational dimensions across immigration background and socio-economic status (Hartmann et al., 2012). Another study in preschool students found that while students from higher socio-economic status typically performed better on a puzzle task, there were no differences in achievement goal orientations across socio-economic status (Day & Burns, 2011). Finally, a 2017 study only found an insignificant positive relationship between mastery goals and socio-economic status; another conflicting result from this study included the positive correlation with performance-approach, performance-avoidance, and mastery-avoidance goals (Abid et al., 2017). The consideration of the above results is important and indicates more investigation is needed in this area.

Current Interventions

Interventions relating to achievement goal orientations can be readily found for high school and college students, but not as easily for middle school students. However, based on what is known in older students and qualitative information from middle school students about perceptions of teacher behaviors, the design of an intervention could be

facilitated. Overall, interventions that target increasing mastery goals tend to be effective in meeting this purpose, and a decline in performance goals (primarily performance-avoidance, with some instances of performance-approach) is observed, alongside an increase in achievement; studies where mastery orientations decreased also observed a decrease in achievement (DeBacker et al., 2018; Lonn et al., 2014; Mupira & Ramnarain, 2018; O’Keefe et al., 2013).

As students transition from high school to college, some universities offer “Bridge” programs during the summer for students to become accustomed to functioning at a university. One such program studied by Lonn, Aguilar, and Teasley (2014) incorporated these concepts as well as an “early warning system” for advising staff if a student has low achievement, and the program compared this information to survey data on student achievement goals. Over the course of this bridge program, mastery orientations decreased, and this change was seen even more strongly in students whose advisors discussed the results of the warning system data with them. Furthermore, mastery orientations were negatively related to achievement data in math; the better that the student did in remedial math, the lower that their mastery orientation was. (Lonn et al., 2014). The impact of this bridge program is notable as, to succeed in these given college courses, students may have found it more adaptive to not have a mastery orientation; this is different from how we typically think of achievement goal orientations and thus well worth noting.

On the other hand, interventions that focused on achievement goal orientations in high school students tend to see increases in mastery goals and decreases in performance

goals. For instance, a 2018 study by DeBacker, Heddy, Kershen, Crowson, Looney, and Goldman looked at a “one shot” intervention administered during a single class period, specifically to examine its ability to increase mastery goal orientations. This intervention had three parts: a lesson on mastery goals and growth mindsets, a worksheet on mastery goals and growth mindsets, and a writing assignment where the students had to write a letter to another student explaining how mastery goals and growth mindsets were beneficial. Compared to students who did not encounter this intervention, students who were exposed saw increases in mastery goals and growth mindsets and decreases in performance-avoidance goals, with some students seeing decreases in performance-approach goals as well (DeBacker et al., 2018).

Another intervention as explored by Mupira and Ramnarain (2018) took 10th grade science students from South Africa and, had them engage for six weeks in “5E inquiry” lessons that incorporate the concepts of engagement, exploration, explanation, elaboration, and evaluation. Students in this experimental group as compared to the control group saw increases in mastery goal orientations and a decrease in performance goal orientations (Mupira & Ramnarain, 2018). Similar results were seen from a three-week mastery intervention for 8th-10th graders as described by O’Keefe, Ben-Eliyahu, and Linnenbrink-Garcia (2013). This program was a summer enrichment intervention that involved seven hours of classes on weekdays and three hours of classes on weekends, and courses consisted of mastery-structured activities that allowed students to be challenged and integrate new knowledge and materials into their pre-existing context. In addition to increases in mastery goal orientations and decreases in performance goal

orientations, it was noted these changes lasted for six months beyond the end of the presented intervention; furthermore, it is theorized that the presented decrease in performance goal orientations was likely related to a decrease in contingent self-worth related to outperforming others as with increased mastery goal orientations students did not necessarily base their self-worth on comparisons with others (O’Keefe et al., 2013).

Considering these findings, interventions that focus on cultivating mastery skills and environments increase mastery goal orientations in students. On the other hand, those interventions that focus on monitoring achievement and notifying students when they are doing poorly reduce mastery goal orientations. Taking these contexts into consideration, it would also be helpful to know what middle school students perceive as supportive of a mastery environment regarding teacher behavior as this could inform the development of learning environments to better foster these concepts. After being surveyed, middle school students participating in one study indicated that the following teacher behaviors cultivated mastery climates: cultivation of student conceptual understanding instead of memorization; not having students memorize material; being comfortable with student mistakes; encouraging students to have fun learning; spending time on concepts; and giving credit for effort. (Patrick & Ryan, 2008). Putting all of these factors together could lead to the development of an effective intervention for achievement goal orientations in middle school students; this concept is vital as there is a distinct lack of interventions integrated into curricula focusing on fostering adaptive achievement goal orientations in middle school students when these students are developing their study skills and agency,

and instead interventions focus on high school and college students when many of these habits, whether productive or maladaptive, have already been established.

Self-Efficacy for Self-Regulated Learning

Self-regulation itself is an influential and important concept in education, and student belief in their ability to use such strategies is connected to not only using these strategies, but subsequent achievement as well. This has been looked at across development and most commonly in college students. In this age group, general findings indicate self-efficacy for SRL is positively related to achievement, such as in a 2012 study by Ismail and Sharma, and a 2009 study by Kitsantas and Zimmerman. In addition, mastery goal orientations have been seen to be correlated with SRL in this age group; performance-avoidance orientations have been seen to be negatively related to SRL (Radosevich et al., 2004). Furthermore, in English Language Learners (ELL) the amount of SRL strategies a student engages in has been seen to be positively correlated with their levels of self-efficacy (Kim et al., 2015). It is important to note that a 2016 study by DiFrancesca, Nietfeld, and Cao found that, among college students, no differences in self-efficacy for SRL were observed across levels of achievement.

Though research in college students sets a strong foundation for knowledge regarding self-efficacy for SRL, understanding this construct in childhood and adolescence is important to the research at hand. Generally, across development, age and self-efficacy for SRL have been found to be negatively correlated (Pajares & Valiante, 2002). Beginning in elementary school, mastery goal orientations are seen to be

positively correlated with self-efficacy and SRL (Shannon et al., 2012) and SRL was able to positively predict achievement (Kitsantas et al., 2009).

Conversely, compared to elementary school students, high school students exist on the other end of the developmental spectrum of childhood and adolescence. Research in this age group has generally uncovered that self-efficacy and SRL are positively correlated, and in turn these are correlated with academic achievement. One study went so far as to uncover a causal relationship between self-efficacy for SRL, self-efficacy for achievement, and reported academic achievement (Zimmerman & Martinez-Pons, 1990). Furthermore, gender may play a part as one study found females have greater self-efficacy when implementing SRL than males. This demonstrates that beliefs effectively lay a foundation for SRL, but that males need different support than females when fostering SRL (Abdullah, 2016). Another study found SRL behaviors had a strong negative correlation with cheating behavior, but achievement goal orientations, regardless of type, were not related to cheating at all; SRL, therefore, may lead to more adaptive learning behaviors (Lestari & Mutiah, 2020). Finally, in populations of students with ADHD, females with ADHD had lower self-efficacy for SRL than any other group while males with ADHD had lower self-efficacy for SRL than females without ADHD, but higher than females with, and IQ was positively correlated with self-efficacy for SRL (Major et al., 2013).

Developmental transitions have also been examined regarding self-efficacy for SRL. A 1990 study by Zimmerman and Martinez-Pons aimed to examine self-efficacy for SRL across various areas in gifted students, including grade, gender, and aptitude.

Gifted students overall demonstrated the use of more SRL skills than regular students in both verbal and mathematical contexts. Self-efficacy for learning increased with grade level; this increase was significant between elementary and middle school for gifted students, and between middle and high school for regular students. Gender differences were observed, with female students using more SRL skills than male students. As expected, students with increased self-efficacy for learning used more SRL skills (Zimmerman & Martinez-Pons, 1990). Such findings correspond with a subsequent 1996 study by Bandura et al., which looked at the impact of self-efficacy on academic achievement. Student self-efficacy for learning was related to prosocial behaviors, class engagement, and increased achievement, amongst other constructs. Socioeconomic status mediated academic achievement through parental achievement aspirations which influenced student self-efficacy for learning; the higher the socio-economic status, the increased parental achievement aspirations, which increased student self-efficacy, resulting in higher achievement (Bandura et al., 1996). Overall, students who believed they could use SRL skills applied those skills more frequently than students who did not have these beliefs, and as a result saw increased academic success.

Middle school students, who comprise the population at hand in this study, have also seen research into self-efficacy for SRL. Typically, self-efficacy for SRL is seen to be correlated with mastery goals (Wolters et al., 1996), collaborative learning (Feldmann et al., 1995) as well as achievement (Britner & Pajares, 2006; Zuffiano et al., 2013). A notable 2006 study by Usher and Pajares looked at the influence of self-efficacy on the SRL of middle school students across, achievement, and race. Two hundred sixty-three

6th grade students (140 female, 123 male) from a suburban school in the southeast U.S. answered surveys. The researchers found that self-efficacy for SRL was predicted by mastery experiences, vicarious experiences, social persuasion, and physiological state for all students. Girls were assigned predictions for self-efficacy for SRL based on individual mastery experiences and social persuasion, whereas mastery and vicarious experiences predicted self-efficacy for SRL for boys. Mastery experience was not a predictor for self-efficacy for SRL if the student was low achieving. (Usher & Pajares, 2006).

Understanding such variations in what students need to cultivate self-efficacy for SRL, as well as what the result of that cultivation looks like, is not only important for future research, but for classroom application as well.

A 2008 study by Caprara et al. examined self-efficacy for SRL, academic achievement, and gender longitudinally in students. Both males and females experienced reductions in self-efficacy for SRL over time, the reduction was greater for males. Furthermore, self-efficacy for SRL was positively predictive of grades and the less this declined the higher the student's grades and the less likely the student was to drop out. (Caprara et al., 2008). These results are reasonable, particularly with respect to a notable 2006 study by Usher and Pajares. The researchers found that male and female students demonstrated self-efficacy for SRL skills based upon different classroom experiences. Girls developed self-efficacy for SRL based on individual mastery experiences and social persuasion, whereas mastery and vicarious experiences predicted self-efficacy for SRL for boys (Usher & Pajares, 2006).

A contrasting study inspected how self-efficacy for SRL related to academic achievement across several constructs, including gender. Middle school students (n = 170) responded to self-report surveys and the data were analyzed using correlational analysis and structural equation modeling (SEM). This study did not find that gender predicted academic achievement, but self-efficacy for SRL was predictive (Zuffiano et al., 2013). Though these authors may not have observed gender differences, such differences are well-established in the literature. As other studies have shown, and building upon other research referenced, it can still be concluded that it is worthwhile self-efficacy for SRL to be fostered in students to support academic achievement.

Socio-Economic Status

Again, the middle school examined in this study is in a low-income, rural region, and understanding how socio-economic status relates to self-efficacy for SRL may illuminate some aspects of the results of the implementation of this intervention. However, little research was uncovered that actively explored the relationship between self-efficacy for self-regulation learning and low socio-economic status. Overall, these studies find that low socio-economic status is negatively correlated with achievement, whereas self-efficacy for SRL is positively correlated with achievement (Adams & Forsyth, 2013; Cleary & Kitsantas, 2017). As an example, a 2017 study by Cleary and Kitsantas looked at survey data from middle school mathematics students and found that socio-economic status and self-efficacy for SRL were both predictors of mathematics performance, with socio-economic status negatively predicting achievement and self-

efficacy for SRL positively predicting achievement. Self-efficacy was also found to mediate the relationship between achievement and SRL (Cleary & Kitsantas, 2017).

There are other factors that play into self-efficacy for SRL. A 2013 study by Adams and Forsyth looked to see if trust in school faculty trust could modulate student achievement and self-efficacy for SRL across socio-economic status. SRL was found to modulate the impact of faculty trust on student achievement in reading and math; with SRL in the picture trust had an insignificant effect on achievement. They also found that faculty trust had a strong relationship with and effect on SRL in students who were and were not in free and reduced lunch programs. This would seem to indicate that, regardless of socio-economic status, the more that faculty trust students, the more SRL that the students engage in, and the higher their achievement is (Adams & Forsyth, 2013).

Current Interventions

Interventions and experimental studies on self-efficacy for SRL seem to focus on high school students (Cleary et al, 2008; Cleary & Platten, 2013; Kitsantas et al., 2004; Sandhu & Zarabi, 2019) and middle school students (Cleary et al, 2017; Peters & Kitsantas, 2010). In general, interventions that focus on this construct seem to improve self-efficacy for SRL, as well as general self-efficacy, achievement, and positive affect (Kitsantas et al, 2004; Sandhu & Zarabi, 2019). Furthermore, students who are given the opportunity to self-evaluate and/or have learning goals set regarding the learning process—rather than learning outcomes—improve in the domain of self-efficacy for SRL (Kitsantas et al., 2004). As an example, an intervention in high school students that was broken down into 30 lessons—10 for reading skills, and 20 for writing skills—saw

increases in self-confidence, efficacy expectations, positive attitude, and outcome expectations, as well as overall self-efficacy (Sandhu & Zarabi, 2019).

One intervention that has been tested with high school students is called the Self-Regulation Empowerment Program (SREP; Cleary et al., 2008; Cleary & Platten, 2013). This is an 11-week program that covers student beliefs; task analysis, studying, and test performance; goal setting for different classes, assignments, and lengths of time; planning to reach goals; learning strategies; and self-reflection. Generally, students who were given the opportunity to be directly taught these skills improved in both self-efficacy for SRL and achievement (Cleary et al., 2008).

Another study on this intervention which focused on four low-achieving students, however, did note a gender difference in male and female participants, as well as an impact on results by attendance. A female participant showed increased achievement and SRL behaviors as her attendance increased, but no increase in self-efficacy for SRL. One male who participated maintained high self-efficacy, high attendance, and an increase in achievement; however, two male participants, after an initial improvement, demonstrated a decrease in attendance and self-efficacy for SRL. This would seem to demonstrate that, for these males, consistent attendance to an SRL intervention may boost both SRL behaviors and self-efficacy for SRL, but not attending regularly will not help the skills develop; whereas for this female, the intervention may have fostered SRL, but self-efficacy may not be impacted by an intervention. Furthermore, initial low self-efficacy may make attendance to an intervention difficult initially (Cleary & Platten, 2013).

This same intervention has also been tested in middle school students (Cleary et al., 2017). This study, however, yielded different results to those seen in high school students. No differences were observed between the intervention and comparison groups regarding self-efficacy for SRL. Interestingly, despite this, the intervention group saw improvements in achievement over the course of the study (Cleary et al., 2017). These improvements demonstrated by the intervention group may be indicative of high school students and middle school students needing different instruction during an intervention to practice and gain the skill of self-efficacy for SRL; this could be due to middle school students being earlier in their cognitive development, and this developmental difference should be considered when constructing interventions.

An alternative intervention, titled Embedded Metacognitive Prompts based on Nature of Science (EMP NOS), emphasizes metacognitive thinking, and did demonstrate between-group differences in the domain of self-efficacy for SRL (Peters & Kitsantas, 2010). In this intervention, lesson plans are embedded with four modules to support the development of metacognition in students in science. Each module focused on a different aspect of science and Zimmerman's model of self-regulation; metacognitive checklists for students to use, as well as metacognitive questions for the students to ask themselves, were weaved into the lessons. This intervention was specifically worked into an existing subject class for middle school students, whereas SREP existed as a new, separate class focused on study skills. This integration could potentially be related to the difference in impact of these interventions on middle versus high school students.

Considering the given information, it is very clear that a pattern exists in implementation of interventions focused on self-efficacy for SRL, not unlike the pattern that exists with achievement goal orientations: such interventions are more common in high school and college students, where such students may have already established their self-efficacy for SRL. Utilization of an intervention for self-efficacy for SRL in middle school, where students are developing their self-efficacy, may be beneficial for the student's development and achievement.

Medium of Instruction

K-12 education is typically performed in a face-to-face medium of instruction, where students are present in a classroom along with their teacher, and they can interact throughout the learning process in-person. This was not the case for much of 2020 and 2021 due to the public health context as a result of the COVID-19 pandemic; in fact, at the middle school examined in this study, instruction during the 2020-2021 school year took place for most students through a hybrid medium of instruction, where a portion of their classes took place in-person, and the remainder took place online. While completely online education was available to some students this school year, the intervention examined was implemented in a hybrid medium of instruction, necessitating the examination of differences between learning environments as established in the literature.

Achievement Goal Orientations

The 2020-2021 academic year is unique due to much instruction taking place either in a fully online (where students engage in academic work, synchronously or asynchronously, from home or another non-school environment via a computer or other

electronic device) or in a hybrid (partially online and partially face-to-face in the classroom) instructional environment due to the COVID-19 global pandemic. Though such measures were implemented for student safety, the impact of these learning environments on student learning has not been fully explored. Further, minimal research was discovered over the course of this literature relating to achievement goal orientations in the context of the online classroom, and most of the research that does exist in that arena pertains to undergraduate and graduate university students.

Despite these gaps, the body of existing literature that addresses achievement goal orientations in online learning contexts seems to correspond strongly to the established literature regarding this construct in traditional learning environments. For instance, a 2012 study by Chen and Wu explored achievement goal orientations and academic achievement in online learning environments for high school students responding to self-report questionnaires. The primary focus of the authors was on performance goal orientations. They discovered that students with these orientations demonstrated learning goals, but this orientation was negatively correlated with a need for cognition. Furthermore, performance-avoidance orientations were negatively correlated with academic achievement. The relationship between performance goal orientations and academic achievement was mediated by metacognitive skills (Chen & Wu, 2012). These findings correlate with prior research illuminating how extrinsic motivation related to performance orientations, as well as approach orientations correlating with increased achievement and avoidance orientations correlating with decreased achievement in traditional learning environments.

As discussed earlier, the bulk of the research examining achievement goal orientations in online education explores this niche in university students. For instance, one study used structural equation modeling to examine the achievement goal orientations of undergraduate chemistry students. They discovered that performance orientations were positively correlated with the use of worked examples of chemistry problems during online learning; these examples also correlated with increased self-efficacy and academic achievement. Mastery-approach orientations were positively related to achievement, and mastery-avoidance negatively so (Crippen et al., 2009). Again, these results correspond with what is found in traditional classrooms.

This trend is consistent, even into online graduate studies. A 2019 study by Yeh et al. aimed to explore the relationship between achievement goal orientations and expectations for academic achievement of both undergraduate and graduate students in online learning courses. It was discovered that mastery goal orientations were predictive of the use of SRL skills during online learning, which in turn predicted expected academic achievement. Approach orientations correlated with increased SRL skill use, which predicted increased expected achievement; the opposite was observed with avoidance mastery goals (Yeh et al., 2019). It is therefore clear that, across the experiences of students of all ages, as well as across engagement in a variety of learning environments, mastery and approach goal orientations are beneficial to educational success, avoidance orientations are typically maladaptive, and performance orientations may have a varying impact dependent on context and pedagogy.

Self-Efficacy for Self-Regulated Learning

As with achievement goal orientations, self-efficacy for SRL has a minimal body of literature pertaining to online and remote learning environments. Furthermore, most established literature again pertains to university students of various levels. While informative for establishment of a foundation in this literature review, the lack of research on this construct in K-12 online learning environments is notable. This gap possesses an increased impact at present in particular due to the COVID-19 pandemic, when many elementary and secondary students must engage in learning without a teacher physically present to provide as much structure and guidance as would be experienced during a typical school year. Due to the independence presented to students because of social distancing measures, and the importance of SRL skills for academic success, it is now more important than ever for students to have self-efficacy in these study skills.

Due to the transition and growth of students during the middle school years, exploring self-efficacy for SRL in online classes for these students is even more vital, as skills established during this time are impactful for sustained academic achievement. Despite this importance, only one study relating to secondary school students was discovered during the preparation of this literature review. This study by Li and Zheng aimed to examine how self-efficacy and SRL operate in online learning environments and are mediated by task values. Through the administration of self-report questionnaires to 299 seventh grade students, they saw that self-efficacy predicted use of SRL skills in online learning environments, and this relationship was mediated by utility value. Students who believed in their ability to use SRL skills as well as understood how useful

these skills could be for learning engaged in SRL (Li & Zheng, 2018). Just as was seen with achievement goal orientations in online learning environments, this finding regarding self-efficacy for SRL in middle school students seems to correspond with the established literature for traditional learning environments.

More literature exists examining self-efficacy for SRL in university students taking online classes, and these findings again seem to correspond with what is known about this construct in traditional educational environments. For instance, one study found feedback administered to undergraduate students daily online regarding time management significantly increased student self-efficacy for SRL (Terry & Doolittle, 2008). Another study explored the impact of self-efficacy and SRL on undergraduate students in an online class and found self-efficacy and self-regulation skills were correlated with academic achievement in online classes (Bradley et al., 2017). This is well-aligned with the established body of literature around self-efficacy for SRL, showing that trends in online education match up with what is observed in traditional classrooms.

There is some variation, however. A 2008 study by Puzziferro aimed to investigate academic achievement's relationship with self-efficacy and SRL in an online learning environment. Undergraduate students (n = 815) responded to online self-report questionnaires and after analysis, this study did not find a relationship with self-efficacy for online learning and achievement but did find a relationship between SRL skills and academic achievement in an online learning environment (Puzziferro, 2008). While this

finding regarding SRL skills is aligned with the current literature, it is notable that self-efficacy did not play a part for these students' achievement.

It is also worth exploring, not only the relationships between these constructs and achievement, but also what learning and teaching tools foster self-efficacy for SRL in students engaged in online coursework. A 2005 study by Dabbagh and Kitsantas aimed to do just this by examining how components of online learning environments support SRL in students. Sixty-five university students enrolled in online courses responded to self-report questionnaires, and 46 students responded to qualitative surveys. After analysis, the authors found content creation and different teaching delivery tools (such as readings and rubrics) fostered goal setting, asking for help, reflection and evaluation, and strategy use with respect to SRL. Tools for student collaboration and communication (such as discussion boards) also fostered goals, time management, planning, and asking for help components of SRL. Administrative tools including calendars fostered monitoring, evaluation, planning, time management, and asking for help components of SRL. Assessments fostered student strategy use, monitoring, and evaluation (Dabbagh & Kitsantas, 2005). In this growing frontier of online education, this toolbox of techniques can support fostering self-efficacy for SRL in students, and in turn their overall academic achievement.

Student-Led Assessment

Student-led assessment (SLA) involves students and their peers, rather than educators, determining the course and method of assessment, as well as administering the assessment themselves regarding either their own work or that of their peers. This method

tends to encourage expedited evaluation of student work and provides extra incentive to complete work on time (McMahon, 2010). Specific constructs that operate as elements of SLA to help students develop and meet academic goals include curiosity, deep learning experiences, growth mindset, motivation, school connectedness, self-advocacy, and SRL (Greenstein & Burke, 2020). Prior research has established that, when these constructs are presented to students as components of a consistent structure of the learning activity, students and teachers find this format of learning class content and evaluating and assessing work effective and useful. This includes a consistent evaluator (self or peers), simple language (McMahon, 2010). These aspects all facilitate collaboration and self-reflection (Harris et al., 2015).

Intrinsic interest fuels the drive behind the curiosity component of SLA, allowing these learning environments to be successful; the student and their personally relevant interests need to be at the core of SLA. Incorporating what the student brings to the classroom as a component of their learning going forward makes SLA more effective than it would be without these education methods centering on these concepts. This curiosity is further cultivated in SLA contexts in part through communication and feedback provided to students based upon content and activities in which students have a vested interest (Andrade, Huff, & Brooke, 2012).

Deep learning experiences, where students use their agency and learning skills when responding to prompts that are personally relevant to them, and allow them to share and reflect upon their learning with others, are also core to SLA (James et al., 2007). Students who engage in class projects with expert teachers as facilitators for content

demonstrate high levels of deep learning (Steele et al., 2000). Deep learning experiences are most effective when focused on the individual growth of the student such that they become individualized to ensure personal relevance. Student engagement in this process is an emphasis in SLA contexts (Andrade, Huff, & Brooke, 2012).

SLA courses value the individual growth of the student at their core, so the given activities and assessments benefit the students as they work towards their own goals (Andrade, Huff, & Brooke, 2012; Dweck, 2008). These types of student-centered learning experiences emphasize the use of self- and peer-assessments to promote personal growth and collaboration, as well as the use of portfolios and exhibitions to place emphasis on personally relevant projects and the communication of ideas to others. Furthermore, teachers support students as they observe their progress and growth during the learning task (Andrade, Huff, & Brooke, 2012). To this end, feedback provided to students throughout this process, places emphasis on student growth and progress to continue student progress towards goals (James et al., 2007).

Feeling safe and connected to the learning community fulfills student needs, allowing them to work towards their goals and create a sense of personal achievement (Greenstein & Burke, 2020). Techniques such as peer assessment and teacher feedback are utilized during SLA to promote student understanding of content knowledge and collaboration, allowing an increase in the connectedness and support students feel from others at their school (Andrade, Huff, & Brooke, 2012). Additionally, students gaining the ability to reflect and understand their needs allows them to speak up, self advocate, and use their voice to obtain the tools and resources they need to meet their learning goals

(Greenstein & Burke, 2020). This is observed in conjunction with students providing peer feedback, as well as observing their strengths and weaknesses as they work through their goals and request teacher and peer support to meet those goals (Andrade, Huff, & Brooke, 2012).

Motivation and SRL are the final two elements of SLA addressed by the intervention examined in this study. As defined operationally by the surveys administered and the focus group protocol utilized, motivation here centers on student goals and their self-confidence. When defined more technically, these ideas reference achievement goal orientations and self-efficacy beliefs for SRL and learning skills. These concepts both fall under the umbrella of self-motivational beliefs, a component of the forethought phase of SRL (Allshouse, 2016). All three phases of the SRL process—not just the forethought phase—are integral to SLA classes. Without personal goals, monitoring progress, and reflecting on completed work, there is nothing for the student to assess and not as much learning will be able to take place (Andrade, Huff, & Brooke, 2012; Hautamaki et al., 2002). SRL allows students to become actively engaged in their work and progress, facilitating goal and academic achievement (Brown & Harris, 2014).

SLA has been richly studied in graduate and professional school. It is particularly common in the health professions. In this domain, peer-led assessment is found to be more effective than self-led assessment, but it is still implemented as a useful tool (Colthart et al., 2008). A study by Kassab et al. found that medical students engaging in SLA preferred assessment by peers; however, faculty were concerned that students guiding others may not display enough content knowledge to meet the needs of their

peers (Kassab et al., 2005). A 2010 study by Sargeant et al. found similar results. The study clarified how various information sources feed into how individuals interpret educational information based on their internal beliefs, goals, and emotions, which then gears their responses. These are influenced by the context and interpersonal relationships and provides a flexible way for students to self-regulate their responses to reflection on their performance (Sargeant et al., 2010).

SLA is looked at less frequently in undergraduate university and K-12 education. One study looked at the results of undergraduate sport and recreation students designing their own assessments. Inexperienced students struggled with SLA, but experienced students found SLA encouraged their engagement and fostered their SRL skills (Walters et al., 2017). Another study focused on how adolescent students responded to the implementation of student-led formative assessment in the classroom, also found SLA fostered engagement and self-regulation. Teachers used SLA to improve their teaching quality; however, students noted preferring teacher feedback and were concerned about the objectivity of peer scoring, as well as their relationship with their teachers and peers (Harris & Brown, 2013). An additional study found that, during SLA, evaluation tends to consist primarily of evaluation of learning and suggestions for improvement; little feedback is given on self-regulation skills, especially during peer evaluation (Harris et al., 2015). A study by Vanderhoven et al. used an online assessment tool for students to provide each other with feedback and found that anonymous student-assessment helped concerns about peer pressure and disapproval, and students generally enjoyed SLA more than teacher-led assessment (Vanderhoven et al., 2015).

Current Interventions

Few SLA interventions have been scientifically examined in the literature, and nearly all are in university or professional school settings. One study looked at students in a pharmacology course which used SLA in a small-group format. While this format starkly increased difficulty in terms of content and workload volume for students and that they needed support from faculty, they found students experienced value, achieved their learning outcomes, and understood and retained the information (Bouw et al., 2015). Another study compared SLA in small groups versus not using SLA in a project-based learning vocational class for six weeks. It was found that peer assessment fostered trust and group cohesion and feelings of safety, and interpersonal relationships influenced the effectiveness of peer assessment (van Gennip et al., 2010).

SLA has also been investigated in undergraduate university student education. A 2016 study by Casallas and Castellanos examined a six-month long SLA intervention in an English as a Foreign Language course through interviews. They found peer assessment provided motivation for students developing language and argument skills. SLA also promoted engagement, shared responsibility, and reflection, all contributing to student agency (Casallas & Castellanos, 2016). Another study observed a two-year long SLA intervention in which students worked on blog projects in small groups and used peer feedback to improve the blog over time. Evaluations were anonymous, and the criteria for assessments provided to students to work with were consistent. It was found that while students provided lower grades than teachers and they were concerned about

objectivity, students enjoyed this collaborative and communicative process (Ruiz Palmero & Sánchez Rodríguez, 2012).

Overall, prior research has shown that SLA fosters engagement and SRL skills. Students and teachers generally seem to enjoy, and in some cases prefer SLA to traditional assessment. However, students and teachers both addressed concerns about objectivity and interpersonal relationships. Furthermore, research in SLA seems to primarily focus on higher education. A gap in the research seems to exist around SLA in K-12 education, so more work needs to be done to see if these ideas translate to younger students.

Conclusion

Literature Review Limitations

Regarding this literature review, separate limitations are distinguished for both self-efficacy for SRL and achievement goal orientations. In the realm of self-efficacy for SRL there seemed to be a limited amount of research available, particularly with respect to both interventions and to the construct as it applies to middle school students. A small number of researchers came up frequently when searching, and a small group of researchers with fewer publications referenced these same few authors of more influential papers. This limited amount of available literature, while it clarifies the necessity of studies such as this one to fill the gap in this area of research, does mean that the understanding presented in this literature review is limited due to the small scope of the available body of research.

On the other hand, the literature search for achievement goal orientations had the opposite limitation. A large abundance of literature was discovered, but in this area vocabulary and assessments of the constructs seem to have little standardization. Due to the need for common reference terms for the provision of logical structure and boundaries within this literature review, many studies could not be considered. This is unfortunate as many of these studies may have been relevant to the current work. However, as they lacked parallel vocabulary and assessments, it was necessary to pass over these papers; unfortunately, this means important works may have been missed.

In addition to these limitations, it is worth noting that, in the minimal existing literature present on the above constructs and relevant interventions, middle school students saw very little representation. This is a point that has been repeated several times throughout this literature review, which serves to emphasize how this developmental stage is important to the growth of the examined constructs. While that lack of research indicates the importance of examining this SLA intervention to further future research, it does mean that a weakness of this literature review includes a lack of strong analogous interventions to build from.

Regarding the current intervention, it is worth noting that the unusual nature of the school year during which the studied intervention took place. Due to the COVID-19 global pandemic, rather than take place face-to-face in a typical classroom, the SLA intervention took place in an online hybrid format. Because of this alteration, the data obtained in this study may not accurately depict how this intervention is typically implemented. Despite that fact, however, understanding the potential for this SLA

intervention to be taught in an online format is valuable; Regardless of the change in format, it may be worth considering as an online course to reach students who may otherwise not have the opportunity to experience such a class or foster such skills.

Future Research

As mentioned above and discussed several times throughout this literature review, there is a deficiency in research concerning middle school students and interventions that foster self-efficacy for SRL and achievement goal orientations. It is imperative for future research to look more deeply into these constructs at this stage of development; understanding how to teach learners of middle school age the skill of SRL is a concept that is vital to their future achievement. Such a task is a tall order when little information is present on these variables as they relate to this age group and relative interventions. Therefore, future research is needed to fill this void.

Another realm for future exploration involves the interaction of hybrid and online learning environments and motivational constructs on student academic achievement. There does exist a body of literature regarding this niche; however, most research is done with undergraduate and graduate level university students. With the advent of expanded distance learning during the academic years taking place during 2020 and 2021, understanding how remote educational environments can support self-efficacy for SRL and adaptive achievement goal orientations in K-12 students is vital for supporting academic achievement in students who are engaged in these contexts. Furthermore, as this thesis has established, middle school years are an important developmental and transitional stage and understanding effective facilitation of motivation in these students

is important to long-term academic success. Because of the deficit in literature regarding these constructs in middle school students engaged in online learning environments, future research would do well to explore this path.

A third area open for future research deals with student diversity. Many studies examined for this literature review addressed racial and ethnic differences, socioeconomic disparity, the experiences of gifted students, and the experiences of students with learning disabilities. As addressed several times, gender is examined with respect to the discussed constructs; however, in all papers explored, gender is presented in a binary form, with participants all reported as male or female. As gender diversity grows as a pressing issue for equity in education, allowing for non-binary reports of gender and exploration of constructs through a non-binary gender lens could further foster student academic success.

Study Purpose and Rationale

The SLA intervention examined in this thesis is implemented in a rural school district in the mid-Atlantic United States. The intervention is unique in its goal to foster important skills for SRL in middle school students. Despite strong evidence pointing towards the importance of mastery achievement goal orientations and self-efficacy for SRL, school systems tend to wait until college to implement interventions that encompass the above constructs into their curricula. This is often too late as such students may have already developed counterproductive habits regarding SRL skills. Therefore, the present SLA intervention fills an educational gap that exists across the board: it provides a

medium for teaching middle school students to become self-responsible learners as they begin to gain autonomy.

In this study, SLA was implemented for 7th and 8th grade students. Self-efficacy for SRL and achievement goal orientations will be examined in students participating in the intervention via a hybrid (combination online and face-to-face) learning environment. During the SLA intervention, students experienced class project activities and other components of SLA as a way of allowing the students to use their personal motivators to develop SRL skills, build their self-efficacy in this arena, and cultivate their mastery achievement goal orientations. Utilization of an intervention such as this for self-efficacy for SRL and achievement goal orientations in middle school, where students are developing these mindsets, may be beneficial for the student's overall development and achievement.

Research Questions

The purpose of this study was to explore middle school student voices regarding an SLA intervention. In particular, the present goal was to examine the function and utility of the SLA intervention through the eyes of the students. High- and low-achieving middle school students' perceptions were examined regarding their mastery- and performance-approach achievement goal orientations, as well as self-efficacy for SRL through the use of self-report questionnaires. In addition, high- and low-achieving students participated in focus groups regarding the implementation of the intervention. The following research questions were explored:

Research Question 1. What differences are seen in self-efficacy for SRL, and mastery- and performance-approach goal orientations when comparing high-, moderate-, and low-achieving middle school students exposed to the SLA intervention?

Research Question 2. How do high- and low-achieving middle school students perceive the function and usefulness of the SLA intervention to which they were exposed?

Research Question 2.1. How do high- and low-achieving middle school students exposed to an SLA intervention engage in goal setting behaviors and perceive the goal orientations they adopt?

Research Question 2.2. How do high- and low-achieving middle school students exposed to an SLA intervention engage in goal setting behaviors and perceive the goal orientations they adopt?

Chapter Three: Method

Research Questions

The purpose of this study was to explore middle school student voices regarding an SLA intervention. In particular, the present goal was to examine the function and utility of the SLA intervention through the eyes of the students. High- and low-achieving middle school students' perceptions were examined regarding their mastery- and performance-approach achievement goal orientations, as well as self-efficacy for SRL through the use of self-report questionnaires. In addition, high- and low-achieving students participated in focus groups regarding the implementation of the intervention. The following research questions were explored:

Research Question 1

What differences are seen in self-efficacy for SRL, and mastery- and performance-approach goal orientations when comparing high-, moderate-, and low-achieving middle school students exposed to the SLA intervention?

Research Question 2

How do high- and low-achieving middle school students perceive the function and usefulness of the SLA intervention to which they were exposed?

Research Question 2.1. How do high- and low-achieving middle school students exposed to an SLA intervention engage in goal setting behaviors and perceive the goal orientations they adopt?

Research Question 2.2. How do high- and low-achieving middle school students who were exposed to an SLA intervention use SRL strategies and describe their self-efficacy beliefs regarding using these strategies?

Research Design

To address the research questions at hand, a concurrent nested mixed-methods approach was utilized (McMillan, 2016). Survey data were collected across 7th and 8th grade students about achievement goal orientations and self-efficacy beliefs for SRL. A thematic analysis methodology was chosen for analysis of the student focus group transcript data to deeply examine the perceptions of the function and utility of the SLA intervention from the perspective of high- and low-achieving student participants (Braun & Clarke, 2006). The primary goal of integrating the results of quantitative and qualitative data analysis was to understand the phenomenon of the SLA intervention (Flynn & Korcuska, 2018).

Participants

Students

Seventh- and eighth-grade students ($n = 544$) from a rural middle school in the mid-Atlantic United States were invited to participate in the present study. Of these, 179 students' parents consented to their participation in the study. Of the students whose parents provided consent, 106 students provided assent to participate in the study, resulting in a 19.7% participation rate. Depending on their enrollment, students were placed among the SLA intervention group ($n = 99$) or the control group not receiving the SLA intervention ($n = 7$). Descriptive statistics of participants are provided below in

Table 1 and are based upon the racial and ethnic demographic groups outlined by the U.S. Census Bureau (Humes et al., 2011), and socioeconomic status as outlined by the Virginia Department of Education (Virginia Department of Education, 2020).

Table 1
Participant Descriptive Statistics

	N	%
Grade		
7th	47	47.5%
8th	52	52.5%
Gender		
Female	59	59.6%
Male	40	40.4%
Nonbinary	0	0%
Race		
American Indian or Alaska Native	0	0%
Asian	2	2.0%
Black or African American	0	0%
White	96	97.0%

Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	1	1.0%
Ethnicity		
Hispanic or Latina/o/e/x	5	5.1%
Not Hispanic or Latina/o/e/x	94	94.9%
Socioeconomic Status		
Disadvantaged Status	18	18.2%
Not Disadvantaged	81	81.8%

According to the guidelines for sample size for similar kinds of mixed methods studies as compiled by Flynn and Korcuska's analysis—with the recommended sample being greater than 15 participants—the above sample size is appropriate for the research design utilized here. Furthermore, mixed methods approaches such as the ones used in this study place emphasis on purposeful sampling being the core of sample selection (Flynn & Korcuska, 2018). Though participants did self-select into the groups in the study based upon how they chose to enroll, the rural school from which these students were invited to participate was purposefully selected due to the presence of the SLA intervention examined.

Setting

The participating school is a rural middle school in the mid-Atlantic United States. Of the 544 students invited to participate, the vast majority identified as white (n = 517), 17.8% were identified as having a recorded disability (n = 97), 27.2% were recorded as economically disadvantaged (n = 148), and 0.02% were identified to be English Language Learners (n = 5). Demographics are summarized in Table 2 below.

Table 2
Invited Student Population Information

Category	Subcategory	N	%
Diversity	American Indian or Alaska Native	2	0.40%
	Asian	4	0.70%
	Black	7	1.30%
	Native Hawaiian	0	0%
	White	517	95.00%
	Multiple Races	14	2.60%
Ethnicity	Hispanic or Latina/e/o/x	54	9.90%

	Not Hispanic or Latina/e/o/x	490	90.10%
Disabilities	With disabilities	97	17.80%
	Without disabilities	447	82.20%
SES	Disadvantaged	148	27.20%
	Non disadvantaged	396	72.8%
ELL	ELL	5	0.02%
	Non-ELL	539	99.08%
Gender	Male	272	50.00%
	Female	272	50.00%
Grade	7 th grade	246	45.20%
	8 th grade	298	54.8%
	TOTAL STUDENTS	544	100%

Students were engaged in alternative instructional media during the study.

Students had the choice between two primary modes of instruction: online and hybrid.

Online instruction can be defined as students participating in instruction remotely, from home, via a computer or other electronic device, synchronously and/or asynchronously

for greater than 75% of the time as reported by the school. Hybrid instruction can be defined as students participating in online instruction as previously defined for up to 75% of the time, and the remainder of the time attending school and engaging in academic activities in person with their teachers and peers present.

Measures

Student Demographic and Achievement Data

Student demographic data were requested from the school. Student personal information requested included teacher names, current grade, racial background, socio-economic status, and gender identity. Gender identity is a trichotomous variable with options of female, male, and non-binary, and was measured through self-report as a component of school records. Socio-economic status was a dichotomous variable measured according to whether the student's record included disadvantaged status. A student is considered disadvantaged if they are eligible for free and reduced lunch, their family receives funds from the Temporary Assistance for Needy Families Program, is eligible for Medicaid, or is identified as Migrant or Homeless (Virginia Department of Education, 2020).

Academic Achievement. Academic achievement variables from previous years were obtained once during the 2020-2021 school year from longitudinal achievement data recorded by the school, based upon scores on Standards of Learning (SOL) assessments, established by the Virginia Department of Education outlining what students are expected to know at the end of an academic year; specifically, mathematics, reading, writing, and science SOL scores were obtained (Virginia Department of

Education, 2020, Standards of Learning (SOL) & Testing). SOL assessments are scored from 0-600 points. Typically, a score under 400 indicates a failing grade, a score from 400-499 indicates a passing grade, and a score from 500-600 indicates an advanced passing grade (Virginia Department of Education, 2020, SOL Test Scoring & Performance Reports). Different formats are available for the SOL assessments: there are typical paper assessments; a version of assessments in plain English for English Language Learners (denoted by a PE in the assessment name); and a computer-adaptive assessment where question difficulty is adapted based upon how students respond to prior questions (Virginia Department of Education, 2020, Standards of Learning (SOL) & Testing). SOL exams were administered during prior academic years, when participants were enrolled in 3rd through 6th grades. SOL scores were chosen to evaluate student levels of academic achievement due to their availability, as well as their pre-existing division into fail, pass, and pass advanced groups.

The intervention group students were divided into high-, moderately-, and low-achieving students through an examination of student average mathematics SOL scores between the 3rd and 6th grades. Mathematics SOL scores were utilized for this as all participating students took the mathematics SOL appropriate for their grade level at the time. These average mathematics SOL scores were converted to be fail, pass, or pass advanced scores based upon the criteria listed above. After this, 23 students fell into the “fail” category with scores between 304.75 and 397.33, 63 were classified in the “pass” category with scores between 402.00 and 499.33, and 29 were classified as “pass advanced” with scores between 500.33 and 576.33. Descriptive statistics for these

extreme case participants are found below in Tables 3 through 5. Ten students (n = 10) were missing SOL data and so were not included in the tables below.

Table 3
High-Achieving Extreme Case Participant Descriptive Statistics

	N	%
Grade		
7th	13	50.00%
8th	13	50.00%
Gender		
Female	18	69.20%
Male	8	30.80%
Nonbinary	0	0%
Race		
American Indian or Alaska Native	0	0%
Asian	2	7.70%
Black or African American	0	0%
White	24	92.30%
Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	0	0%
Ethnicity		
Hispanic or Latina/o/e/x	0	0%
Not Hispanic or Latina/o/e/x	26	100%
Socioeconomic Status		

Disadvantaged Status	2	7.70%
Not Disadvantaged	24	92.30%

Table 4
Moderately-Achieving Extreme Case Participant Descriptive Statistics

	N	%
Grade		
7th	23	50.00%
8th	23	50.00%
Gender		
Female	23	50.00%
Male	23	50.00%
Nonbinary	0	0%
Race		
American Indian or Alaska Native	0	0%
Asian	0	0%
Black or African American	0	0%
White	46	100%
Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	0	0%
Ethnicity		
Hispanic or Latina/o/e/x	5	10.90%
Not Hispanic or Latina/o/e/x	41	89.10%
Socioeconomic Status		

Disadvantaged Status	7	15.20%
Not Disadvantaged	39	84.80%

Table 5
Low-Achieving Extreme Case Participant Descriptive Statistics

	N	%
Grade		
7th	7	41.20%
8th	10	58.80%
Gender		
Female	13	76.50%
Male	4	23.50%
Nonbinary	0	0%
Race		
American Indian or Alaska Native	0	0%
Asian	0	0%
Black or African American	0	0%
White	16	94.10%
Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	1	5.90%
Ethnicity		
Hispanic or Latina/o/e/x	0	0%
Not Hispanic or Latina/o/e/x	17	100%
Socioeconomic Status		

Disadvantaged Status	6	35.30%
Not Disadvantaged	11	64.70%

Patterns of Adaptive Learning Survey (PALS) (Midgley et al., 1998)

The Personal Mastery Goal Orientation subscale and Personal Performance-Approach Goal Orientation subscale from the Patterns of Adaptive Learning Survey (PALS) aim to assess student levels of mastery and performance-approach achievement goal orientations, respectively. These subscales were chosen as students with higher levels of mastery and performance-approach orientations tend to have higher levels of achievement. The Personal Mastery Goal Orientation subscale has five items, including “It’s important to me that I learn a lot of new concepts this year.” The Personal Performance-Approach Goal Orientation subscale also has five items, including “It’s important to me that other students in my class think I am good at my classwork.” Each item on the instrument can be answered with a 5-point Likert scale, from 1 = Not at all true to 5 = Very true. All items were found to have an acceptable level of internal consistency; both the Personal Mastery Goal Orientation subscale and Personal Performance-Approach Goal Orientation subscale have a Cronbach’s alpha of 0.86. The subscales were found to have a strong construct validity according to the results of confirmatory factor analysis (GFI = 0.97, AGFI = 0.95; Midgley et al., 1998). The instrument was pilot tested by middle school students prior to implementation of the self-report questionnaire portion of this study, and no changes were made after this review.

Self-Efficacy for Learning Form (SELF-A) (Adapted from Zimmerman & Kitsantas, 2007)

The SELF-A measures student self-efficacy for SRL and was chosen for use as students with higher self-efficacy are more motivated to learn and implement SRL skills. The scale has 12 items, including “I have a goal when I study.” The instrument is answered using a 5-point Likert scale (1 = “Never”; 2 = “Not very much”; 3 = “Sometimes”; 4 = “A lot”; 5 = “Always”). The scale has been demonstrated to be extremely reliable (Cronbach’s alpha = 0.97). Confirmatory factor analysis demonstrated good construct validity (cfi = 1.00; Zimmerman & Kitsantas, 2007). A pilot test was performed with middle school students before use within the self-report questionnaire portion of this study, and after the review the wording of the instructions was adjusted to address the SLA intervention in a manner accessible to the target group of participants.

Student Focus Groups

Semi-structured focus groups were utilized for the purpose of exploration of student voices regarding their perceptions of alternative instructional media during the 2020-2021 school year, motivation, and self-regulation, as well as the SLA intervention implemented in the school examined. The focus group protocol questions were centered around student perceptions of the SLA intervention, its function, and its utility, as well as their perceptions of their SRL skills and goal setting. The focus group protocol included 8 questions and was presented to the focus groups in an online meeting over a 30- to 45-minute period. Prior to use in the research procedures, the focus group questions were pilot tested by teachers and middle school students and reworded for clarity and

relevance to be accessible to the participants. Sample questions include “In your classroom, how do your teachers help you learn to work independently?” and “What are some reactions you’ve had about the feedback you’ve received from your teacher?”

Four focus groups occurred. Participating students were placed into a focus group based upon if they were in 7th or 8th grade. Level of achievement also determined group placement. High-achieving students had separate focus groups from low-achieving students, and these students were selected based on consistent “pass advanced” scores on mathematics SOLs from all available prior achievement data. Low-achieving students were conversely placed into separate focus groups, and they were selected based on consistent “fail” scores on mathematics SOLs from all available prior achievement data. Descriptive statistics for focus group participants are included below in Tables 6 and 7.

Table 6
High-Achieving Focus Group Participant Descriptive Statistics

	N	%
Grade		
7th	6	66.7%
8th	3	33.3%
Gender		
Female	5	55.6%
Male	4	44.4%
Nonbinary	0	0%
Race		

American Indian or Alaska Native	0	0%
Asian	1	11.1%
Black or African American	0	0%
White	8	88.9%
Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	0	0%
Ethnicity		
Hispanic or Latina/o/e/x	0	0%
Not Hispanic or Latina/o/e/x	9	100%
Socioeconomic Status		
Disadvantaged Status	0	0%
Not Disadvantaged	9	100%

Table 7
Low-Achieving Focus Group Participant Descriptive Statistics

	N	%
Grade		
7th	2	33.3%
8th	4	66.7%
Gender		
Female	4	66.7%
Male	2	33.3%
Nonbinary	0	0%
Race		

American Indian or Alaska Native	0	0%
Asian	0	0%
Black or African American	0	0%
White	5	83.3%
Native Hawaiian or Other Pacific Islander	0	0%
Other/Multiracial	1	16.7%
Ethnicity		
Hispanic or Latina/o/e/x	0	0%
Not Hispanic or Latina/o/e/x	6	100%
Socioeconomic Status		
Disadvantaged Status	2	33.3%
Not Disadvantaged	4	66.7%

Intervention

The SLA intervention examined by this thesis is a required elective for all students at the middle school studied in this thesis. All students take part in this intervention at least once during their time from 6th to 8th grade as they are enrolled in the school. In this capacity, the students are exposed to a range of content knowledge in this course and apply this information to personally relevant real-world contexts chosen through student-led decisions. Within these contexts, students fill a niche, meet a need, or solve a problem they personally find meaningful. As they work through this process, these students are also engaging in educational policy standards, as well as meeting these

through the individual goals they set with their teacher and group, and in turn demonstrations of ability as they work to meet these goals.

The Student-Led Assessment Intervention

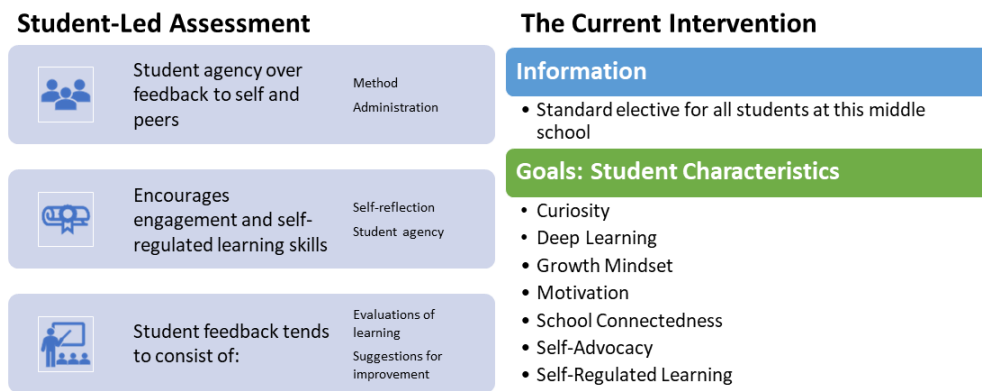


Figure 2
The SLA Intervention

This SLA intervention aims to foster SRL in students through the implementation of SLA concepts, as well as both educator and peer feedback. The characteristics fostered include curiosity, deep learning, growth mindset, motivation, school connectedness, self-advocacy, and self-regulated learning. Furthermore, as this elective course is exploratory in nature, engagement in students is fostered through an introduction to SLA, as well as class projects. This is done by allowing students to identify and work towards goals.

The present SLA intervention is a standard elective course in the curriculum at the middle school studied. The course meets for one hour every other day over the course of

a school year. Within the class itself, students work on innovating to problem solve when engaging in projects and tasks. Each grade level has a different content area central to the class; 6th grade focuses on career investigations, 7th grade focuses on science, and 8th grade focuses on writing. These content areas are used to impart students with generalizable SRL and SLA skills that they can take with them beyond the classroom. These include communication, goal setting, self-monitoring, reflection, and more. All these skills are taught through modeling and scaffolding, as well as observation and analysis of skill use by others.

At the beginning of the school year, students are provided with more structure than they are later in the year. This allows students to learn about and concretely establish the foundations of these content areas at the beginning of the year, as well as gain SLA, SRL, goal setting, and problem-solving skills through teacher modeling. At this time, students are researching and learning the fundamentals of the content area of their class. As the year progresses, teacher scaffolding is faded out, and students proceed in groups to choose projects to work on, set goals, self-assess, and solve problems over the course of the remainder of the school year. During this process, students set their goals, understand how they are expected to grow in skills and content knowledge, use evidence to self-assess and evaluate, and articulate why and how they can adapt in future to continue to grow. Peer feedback and reflection based on this feedback is integral to student growth during this process. By the end of the years, students work independently, and teachers are merely facilitators to support students reaching their goals. Student work takes place

in the middle school's flexible work environment, with workspaces including school common areas, and with assignments being displayed to the public.

Teacher Training

Prior to implementing the SLA intervention, middle school educators are provided with professional learning experiences to give them the tools to use SLA and SRL techniques in their classrooms. These programs define these constructs to provide teachers with an understanding of related foundational concepts; model the use of SLA and SRL in the classroom; connect SLA and SRL to other educational constructs; and give the educators the opportunity to develop potential lesson plans that utilize the skills they learn.

When learning how to implement the SLA intervention, teacher training is founded upon five main ideas, including building self-directedness, personal relevancy, sharing and reflection with evidence, voice and choice, and equitable process and assessment. Self-directedness is a focus of training to ensure that educators can facilitate student goal setting, self-observation, and self-reflection. In this same vein, training emphasizes personal relevancy, so the goals students set are directly connected to the background of the student, enabling a connection between course activities and self-understanding. Sharing and reflection with evidence is referential to how educators foster self-reflection in students so they can observe their own growth through the development of an end product they can share with others; this end product may be one of a student's goals. Furthermore, voice and choice are core to the creation of this product as teachers provide students with agency when creating their end goal, as well as the subgoals and

deadlines to meet the goal of the final product. As an underlying theme throughout these four concepts, equitable process and assessment is taught to educators such that they can use SLA in a differentiated manner to meet individual student needs. This may manifest through ensuring work is an appropriate challenge, scaffolding during learning, mastery-centered feedback, and a motivating work environment.

Procedures

This study used a concurrent nested mixed methods design to examine middle school students' voices with respect to their perceptions of an SLA intervention, as well as explore how SLA interacts with self-efficacy beliefs for SRL and achievement goal orientations. This design allows us to gain insight into how students see the SLA intervention functioning during implementation, as well as its usefulness, particularly with how it fosters their achievement goal orientations and self-efficacy beliefs for SRL. Furthermore, since both high- and low-achieving students participated in the intervention, focus groups are used as a part of the design to explore different perceptions of the intervention across levels of achievement. To examine these constructs in this research design, participants who were enrolled in the intervention in a hybrid educational format were divided into three groups based upon their mathematics SOL scores: high-moderately-, and low-achieving groups. Low-achieving students had a history of failing scores on the SOLs between 3rd and 6th grade, and high-achieving students had a history of pass-advanced scores between 3rd and 6th grade. All other students were considered to be moderate-achieving.

Prior to the implementation of this existing intervention, parents and teachers were informed about the study via a recruitment letter. During November and December 2020, the students in the intervention group were invited to participate in the study. Parental consent for data collection was obtained in January 2021; parents and students who did not consent and assent were able to opt out of data collection for this study. Student consent was later obtained in April and May of 2021. In May 2021, during the fourth quarter and after students and teachers had time to adjust to the format of the 2020-2021 school year, online surveys were administered to participating students. Finally, also in May of 2021, four total groups of 4 to 6 high and low achieving students in 7th and 8th grade intervention group participated in online focus groups to discuss their experience of the alternative learning media during the school year, their perspectives on self-regulation and motivation, and finally their experiences of the SLA intervention.

Data Analysis

Research Question 1

Question 1. What differences are seen in self-efficacy for SRL, and mastery- and performance-approach goal orientations when comparing high- and low-achieving middle school students exposed to the SLA intervention?

Analysis. The first question addressed by this thesis addresses differences between high- and low-achieving middle school students participating in the SLA intervention with regard to self-efficacy beliefs for SRL (dependent variable 1; DV1) and achievement goal orientations (mastery versus performance; dependent variable 2; DV2). First, descriptive statistics including means and standard deviations of the two constructs

(DV1, DV2) for all three of the groups (high-, moderately, and low-achieving middle school students) were presented. Second, a one-way Analysis of Variance (ANOVA) was used to examine if there is a significant mean difference among the two groups on a combination of the two constructs.

Research Question 2

Question 2. How do high- and low-achieving middle school students perceive the function and usefulness of the SLA intervention to which they were exposed?

Question 2.1. How do high- and low-achieving middle school students exposed to an SLA intervention engage in goal setting behaviors and perceive the goal orientations they adopt?

Question 2.2. How do high- and low-achieving middle school students who are exposed to an SLA intervention use SRL strategies and describe their self-efficacy beliefs regarding using these strategies?

Analysis. The second research question addressed by this thesis aims to examine how high- and low-achieving students perceive the “learning how to learn” SLA class they experienced. This research question was examined through qualitative thematic analysis of the semi-structured focus group transcripts. In accordance with Flynn and Korcuska’s (2018) findings regarding credible thematic research data analysis, methods used here included a priori and in vivo open and descriptive coding, which were used to find clusters of meaning through an analysis of themes. Trustworthiness procedures utilized included coding until saturation was established, triangulation of themes using a

second coder, as well as the establishment and maintenance of reflexive notes by the coders.

Coding Description. The procedures followed when coding the focus group data are described below. In addition to the following guidance from Flynn and Korcuska (2018), additional thematic analysis procedures described in Braun and Clarke (2006) were followed all through the qualitative data analysis process.

Initial Coding. After the focus groups were completed, all transcriptions were obtained and cleaned for accuracy. Following transcript cleaning and prior beginning to data analysis, coders initiated a compilation of reflexive notes to record research thoughts and inherent biases as they emerged during the coding process to ensure anything that may influence the coding process may be recorded. These notes were consistently updated through this process. Coders then read through all semi-structured focus group transcripts in full. This step enabled coders to thoroughly understand the content of each transcript, revisit the reflexive notes in case any influential biases were missed, as well as begin to formulate an idea of prominent ideas in the transcripts.

Transcripts, alongside a pre-existing a priori code system, were then imported into qualitative coding software, MAXQDA, for subsequent steps. Code systems were developed based upon instruments on the constructs of noted; some components of these constructs, such as “information recall” as related to curiosity, were contradictory in isolation but related to the construct in context. Such codes were used as both examples of the subcomponent of the construct, as well as counterexamples when applicable. Memos were used within the application to record clarifying notes and interpretations, as

well as code definitions, especially with respect to the above regarding counterexamples. Coders worked through each individual focus group transcript, first reading through and using in vivo and descriptive coding for emergent ideas, followed by a second pass using a priori codes. These codes were applied to relevant phrases extracted from the transcripts. The length of excerpts varied depending on the content and context necessary to support the association between the excerpt and the code. A priori codes utilized are outlined in the tables below. Following completion of individual in vivo, descriptive, and a priori coding, coders collaborated to revise the titles of in vivo and descriptive codes to clearly encapsulate the definitions of each emergent code. This was done to ensure that the final code titles for emergent ideas were locally founded on the quotes included in the code itself. Coders discussed application of these codes until complete agreement on the application of each code to quotes was achieved, and triangulation occurred.

Table 8
A Priori Codes: Deep Learning

Tier 1 Code	Tier 2 Code	Tier 3 Code	Tier 4 Code	Tier 5 Code
Deep Learning	Designing and Facilitating Learning Experiences	Middle	Building Self-Directedness	Goal Reflection During Performance
		Launch	Voice and Choice	Seeking Feedback
				Topic Selection
				Strategy
				Inquiry Question Development
		End	Sharing with Reflection	Reflecting on Learning Process

			Sharing End Product
Scaffolding and Accessibility	Supports		
	Resources		
Frame	Student Prompt	Voice and Choice	
		Personal Relevancy	
		Sharing with Reflection	
Foundation and Learning Goals	Content		
	Competencies		
Deeper Learning Reflection and Feedback	Evaluator		
	Tools for Evaluation		

Table 9
A Priori Codes: Self-Regulated Learning

Tier 1 Code	Tier 2 Code	Tier 3 Code	Tier 4 Code	Tier 5 Code
Self-Regulated Learning	Forethought	Self-Motivational Beliefs	Intrinsic Interest/Valuing	
			Goal Orientation	Mastery
				Performance
			Self-Efficacy	
			Outcome Expectations	
		Task Analysis	Goal Setting	
			Strategic Planning	
	Performance	Self-Control	Regulatory Strategies	Attention Focusing
				Self-Instruction
				Imagery

		Task Strategies	Seeking Information
			Self-Consequating
			Rehearsing and Memorizing
	Self-Observation	Self-Recording	
		Self-Experimentation	
Reflection	Self-Judgement	Causal Attribution	
		Self-Evaluation	
	Self-Reaction	Self-Satisfaction/Affect	
	Self-Reflection	Adaptive Inferences	
		Defensive Inferences	

Table 10
A Priori Codes: Growth Mindset

Tier 1 Code	Tier 2 Code	Tier 3 Code
Growth Mindset	Growth	Embracing Challenge
		Persisting through obstacles
		Effort is the path to mastery
		Feedback is a way to learn
		Feels inspired by the success of others
	Fixed	Seeing feedback as negative
		Giving up when encountering obstacles
		Avoiding challenge
		Feeling threatened by the success of others
		Seeing effort as fruitless

Table 11
A Priori Codes: Student Curiosity

Tier 1 Code	Tier 2 Code
Student Curiosity	Inquiry

Persistence
Challenge-Seeking
Deep Processing
Attention
Information Recall

Table 12

A Priori Codes: School Connectedness

Tier 1 Code	Tier 2 Code
School Connectedness	Feel like they are a part of their school
	Feel cared for by others at their school

Table 13

A Priori Codes: Student Self-Advocacy

Tier 1 Code	Tier 2 Code
Student Self-Advocacy	Persuading Others
	Providing appropriate criticism
	Providing appropriate suggestions
	Directing others
	Influence through encouragement
	Influence through support

Frequencies and Categories. Once the initial coding process was complete, MAXQDA was utilized to record the frequency of each code. These frequency totals included the overall frequency of each code across all four focus group transcripts, as well as the frequency of each code across each individual focus group transcript. This allowed for comparison of how prominent each code was across both high- and low-

achieving groups of students. In addition to this, all quotes that fell under each code were examined and broken into categories based upon the major ideas that emerged from within each code. Just as with the codes themselves, categories were reviewed by both coders for complete agreement to establish triangulation. Following this, both frequency and category information for each code was compiled into a separate word processing document to create code sheets. Each code sheet had the name of the code, the total frequency of the code, the frequency of the code in each individual transcript, and a table with all codes and exemplary quotes.

Emergent Themes. The final step of the coding process was to compare categories across all codes, and merge common categories to create themes. Themes were titled based upon the concepts of the categories grouped together. Themes were compiled together into a document with included codes, their categories, and quotes as evidence. Themes were then reviewed by both coders for agreement and triangulation. Once complete agreement was achieved, themes were finalized and compiled in a document including the theme name, definition, exemplar quotes, and included codes.

Chapter Four: Results

Quantitative Results

Descriptive statistics were run on the entire sample ($N = 99$) to examine the means and standard deviations of student scores for their mastery goal orientations, performance-approach goal orientations, and self-efficacy for SRL. Generally, students demonstrated higher mean mastery goal orientations than performance-approach orientations, and their mean self-efficacy for SRL levels were slightly above the score indicating neutral perceptions around their self-efficacy for SRL. Means and standard deviations are reported in Table 14 below.

Table 14
Descriptive Statistics for All Participants ($N = 99$)

	<i>M</i>	<i>SD</i>
Self-Efficacy for Self-Regulated Learning	3.26	.79
Mastery Goal Orientation	3.79	.97
Performance-Approach Goal Orientation	3.05	1.11

After examining descriptive statistics for the entire sample, descriptive statistics for the high-, moderately-, and low-achieving extreme cases were studied. Generally, the high-achieving students tended to score more highly for all three constructs than the low-

achieving students; the margin difference was much smaller for mastery goal orientations than the other two constructs for which the difference was nearly equal. This was also observed when comparing the high-achieving students to the moderate-achieving students, except for with respect to self-efficacy for SRL, where moderate-achieving students scored the highest. In addition, it was noted that the standard deviation for all high- and low-achieving groups with regard to mastery goal orientations, as well as for moderate-achieving students for performance-approach goal orientations, were higher than the other constructs examined, slightly above 1. When the raw data were examined, it was noted that there were some low outliers in the groups with regard to mastery goal orientations with scores below 2, skewing the data and increasing the standard deviation. Descriptive statistics are summarized below in Table 15.

Table 15

Descriptive Statistics across High, Low, and Moderate-Achieving Cases ($N_{low} = 23$; $N_{mid} = 63$; $N_{high} = 29$)

	<i>M</i>	<i>SD</i>
Self-Efficacy for Self-Regulated Learning		
High-Achieving	3.35	.58
Moderate-achieving	3.28	.98
Low-Achieving	3.05	.58
Mastery Goal Orientation		

High-Achieving	3.95	.89
Moderate-achieving	3.71	1.04
Low-Achieving	3.77	1.08
Performance-Approach Goal Orientation		
High-Achieving	3.16	.98
Moderate-achieving	3.07	1.30
Low-Achieving	3.00	.53

The first research question addressed by this study aimed to examine potential differences in self-efficacy for SRL, and mastery and performance-approach goal orientations between high-, moderate-, and low-achieving middle school students exposed to the SLA intervention. To determine if there were significant differences between groups with regard to their self-efficacy for SRL, a one-way ANOVA was calculated. The null hypothesis was retained, concluding there were no significant differences in self-efficacy for SRL between groups, $F(2, 70) = .55, p > .05$.

To determine if there were significant differences between groups with regard to their mastery goal orientations, a one-way ANOVA was conducted. As expected, the null hypothesis was retained, concluding there were no significant differences in mastery goal orientations between groups, $F(2, 72) = .40, p > 0.05$.

To determine if there were significant differences between groups with regard to their performance-approach goal orientations, a one-way ANOVA was calculated. The null hypothesis was retained, concluding there were no significant differences in performance-approach goal orientations between groups, $F(2, 72) = .09, p > 0.05$.

Qualitative Results

The qualitative analysis of the focus group transcripts aimed to examine the voices of high- and low-achieving middle school students around their perceptions of an SLA intervention. More specifically, this analysis aimed to extract themes that indicated how high- and low-achieving middle school students perceived both the function and the utility of SLA intervention examined.

Descriptive statistics were examined for the focus group participants with regard to the constructs of interest. Interestingly, the low-achieving focus group participants scored numerically higher with regard to mastery goal orientations than the high-achieving focus group participants, but both means were close in score. A similar pattern was seen in scores for self-efficacy for SRL. High-achieving students also reported higher performance-approach goal orientation scores than the low-achieving students, albeit only slightly. Descriptive statistics are summarized below in Table 16.

Table 16
Descriptive Statistics for Focus Group Participants

	<i>M</i>	<i>SD</i>
Mastery Goal Orientation		

High-Achieving	3.91	.76
Low-Achieving	4.00	.85
Performance-Approach Goal Orientation		
High-Achieving	3.51	.76
Low-Achieving	3.10	.62
Self-Efficacy for Self-Regulated Learning		
High-Achieving	3.21	.38
Low-Achieving	3.29	.72

Code Frequencies

During the process of thematic analysis, the frequency of each code utilized was tallied. A summary of these frequencies for the overall focus group sample, as well as separate frequencies for the high- and low-achieving groups can be found below in tables 17-23. These tables are ordered from most frequent tier 1 code to least frequent, with all subcodes in the table of their respective tier 1 code. The final table contains all emergent codes and their frequencies.

The most frequent tier 1 codes were “Deep Learning,” followed by “Self-Regulated Learning.” Both were discussed more frequently by high-achieving students than low-achieving students. Of the SRL cycle, the phase most frequently discussed by

participants was the forethought phase, which included subcodes of “Self-Efficacy” and “Goal Orientations”—both constructs explored during the quantitative portion of this study. The forethought phase was again more frequently discussed by high-achieving students than low-achieving students, as were self-efficacy and mastery goal orientations. Overall goal orientations and performance goal orientations were more frequently discussed by low-achieving students than high achieving students.

“Student Self-Advocacy” and its subcodes were the least discussed group of codes by the students, and when it was discussed the high-achieving students tended to discuss it more frequently than the low-achieving students. In addition, three related subcodes (“Persuading Others,” “Influence through Encouragement,” and “Influence through Support”) were not mentioned at all by the students. Other code groups also had concepts not discussed by the students. These included “Rehearsing and Memorizing,” as well as “Self-Experimentation” from the performance phase of SRL. Also included were “Feeling Inspired by the Success of Others” from “Growth Mindsets” and “Seeing Effort as Fruitless” from “Fixed Mindsets.”

Table 17
Deep Learning Code Frequency Information

Code	Overall	High-Achieving	Low-Achieving
Deep Learning*	416	284	132
Designing and Facilitating Learning Experiences**	171	129	42
Scaffolding and Accessibility**	90	54	36
Frame**	79	55	24

Supports***	76	47	29
Student Prompt***	76	52	24
Project Middle***	73	55	18
Building Self-Directedness****	73	55	18
Launch***	70	52	18
Voice and Choice****	67	49	18
Foundation and Learning Goals**	38	23	15
Voice and Choice****	36	25	11
Project Topic Selection*****	33	22	11
Goal reflection during performance*****	24	22	2
Project End***	22	18	4
Sharing with reflection****	22	18	4
Personal Relevancy****	22	13	9
Content***	19	11	8
Deeper Learning Reflection and Feedback**	18	11	7
Seeking Feedback*****	13	7	6
Strategy*****	13	8	5
Inquiry Question Development*****	12	12	0
Competencies***	11	8	3
Reflecting on learning process*****	10	8	2
Evaluator***	9	5	4
Sharing end product*****	9	7	2
Resources***	6	3	3
Sharing with reflection****	6	4	2
Tools for Evaluation***	2	1	1

Note. * = tier 1 code; ** = tier 2 code; *** = tier 3 code; **** = tier 4 code; ***** = tier 5 code

Table 18*Self-Regulated Learning Code Frequency Information*

Code	Overall	High-Achieving	Low-Achieving
Self-Regulated Learning*	399	252	147
Forethought**	195	126	69
Self-Motivational Beliefs***	120	73	47
Performance**	99	58	41
Reflection**	97	63	34
Task Analysis***	72	50	22
Self-Control***	60	40	20
Intrinsic Interest/Valuing****	56	38	18
Self-Judgement***	41	27	14
Goal Setting****	35	22	13
Regulatory Strategies****	29	22	7
Causal Attribution****	29	21	8
Task Strategies****	26	15	11
Self-Observation***	26	14	12
Self-Reaction***	26	15	11
Goal Orientation****	25	11	14
Self-Satisfaction/Affect	23	14	9
Strategic Planning****	22	16	6
Self-Efficacy****	15	10	5
Mastery Orientation*****	13	7	6
Outcome Expectations****	13	9	4
Self-Reflection***	13	6	7
Attention Focusing*****	11	8	3
Seeking Information*****	11	6	5
Performance Orientation*****	9	2	7
Self-Evaluation****	9	4	5
Self-Recording****	5	1	4
Self-Consequating*****	4	1	3

Self-Instruction*****	3	3	0
Adaptive Inferences****	3	1	2
Imagery*****	2	2	0
Defensive Inference*****s	2	0	2
Rehearsing and Memorizing*****	0	0	0
Self-Experimentation****	0	0	0

Note. * = tier 1 code; ** = tier 2 code; *** = tier 3 code; **** = tier 4 code; ***** = tier 5 code

Table 19
Growth Mindset Code Frequency Information

Code	Overall	High-Achieving	Low-Achieving
Growth Mindset*	114	75	39
Growth**	78	52	26
Embracing Challenge***	18	13	5
Fixed**	18	9	9
Persisting through obstacles***	13	10	3
Effort is the path to mastery***	13	8	5
Feedback is a way to learn***	10	4	6
Seeing feedback as negative***	3	1	2
Giving up when encountering obstacles***	3	1	1
Avoiding challenge***	2	1	1
Feeling threatened by the success of others***	1	0	1
Feels inspired by the success of others***	0	0	0
Seeing effort as fruitless***	0	0	0

Note. * = tier 1 code; ** = tier 2 code; *** = tier 3 code

Table 20*Student Curiosity Code Frequency Information*

Code	Overall	High-Achieving	Low-Achieving
Student Curiosity*	89	58	31
Inquiry**	28	19	9
Persistence**	16	7	9
Challenge-Seeking**	12	7	5
Deep Processing**	8	7	1
Attention**	7	5	2
Information Recall**	4	2	2

Note. * = tier 1 code; ** = tier 2 code

Table 21*School Connectedness Code Frequency Information*

Code	Overall	High-Achieving	Low-Achieving
School Connectedness*	88	58	30
Feel cared for by others at school**	41	26	15
Feel like they are a part of their school**	18	12	6

Note. * = tier 1 code; ** = tier 2 code

Table 22*Student Self-Advocacy Code Frequency Information*

Code	Overall	High-Achieving	Low-Achieving
Student Self-Advocacy*	27	17	10
Providing Appropriate Criticism**	4	3	1
Directing Others**	2	1	1
Providing Appropriate Suggestions**	1	1	0
Persuading Others**	0	0	0
Influence through Encouragement**	0	0	0
Influence through Support**	0	0	0

Note. * = tier 1 code; ** = tier 2 code

Table 23***Emergent Code Frequency Information***

Code	Overall	High-Achieving	Low-Achieving
Intentionality*	33	20	13
Learning Communities*	22	9	13
Socialization**	10	4	6
Teacher Support/Influence*	22	18	4
Student-Centered Pedagogy*	21	16	5
Contradictions*	6	5	1

Note. * = tier 1 code; ** = tier 2 code

Student Voice Regarding Perceptions of the Function of the SLA Intervention

When looking at high- and low-achieving middle school student voices regarding perceptions of the function of the SLA intervention, eight themes emerged. These ideas emerged through a thematic analysis of the focus group transcripts, using both a priori codes, as well as emergent codes. An overview of these themes can be found in Table 24 below.

Table 24***Themes Related to Student Perceptions of Intervention Function from Most to Least Prominent***

Title	Definition	Example Quote
Teacher regulation of the learning environment and activities	How students perceive teacher impact and management of all aspects of the classroom.	“Usually, our teachers like explain a lesson, and then they give us an assignment to do. And then we do it, and if we need help then they help us a little bit more. And then if most of the class needs help then we'll do the same assignment- or not the same assignment, the same lesson- the next day just more in depth, and then if we all get it then we'll move on.”

Teacher-guided, student-driven goal progress	How students perceive how goal setting, tracking, management, and completion is driven by the individual students and facilitated by teachers.	“So, my teachers set like deadline, and tell us like to set little target dates along the way, to help us space up the workload and not get overwhelmed.”
Supportive and differentiated student-centered pedagogy	How students perceive teachers centering teaching around the individual needs of students.	“100% our science teacher shows us everything, different, random things that have to do with science or other things. Things that are going on right now. It really keeps us up to date, and just gives us a lot of opportunity to learn things, no matter who you are, you'll probably be interested in it.”
Self-directed inquiry-based projects	How students perceive their direction of project topics to gain content understanding.	“She gave us our essential question, but we get to ask follow up questions to overall answer the central question”
Student response to teacher feedback	How students perceive teacher feedback and their response to said feedback.	“I've had really positive feedback on most of my work, they always say how it's great. Like, when they do point out the imperfections it's more like criticism than like saying you need to do this, or this is bad.”
Teacher intentionality	How students perceive how their teachers are intentional when planning and implementing classroom activities.	“They never assigned work just for us to do work. They always have some type of benefit after we do it.”
Knowledge acquisition and communication through self-directed inquiry.	How students perceive how they own and communicate knowledge gained from classroom activities.	“When we finally get to build it, we can present it and actually know what it is and why it was built. And what was the purpose of it.”
COVID	How students perceive how the COVID-19 pandemic impacted student experiences.	“But then COVID happened and completely messed with our entire structure of how are we gonna actually get it done. It was... like it never actually got finished”

Teacher Regulation of the Learning Environment and Activities. The theme of “Teacher Regulation of the Learning Environment and Activities” emerged from the focus group transcripts. This theme refers to the ways in which the middle school

students perceive how their teachers impact and manage all aspects of the classroom, from the greater context down to the specifics of assignments.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate aspects of the launch and middle portions of these activities. More specifically, students indicated observing their teachers giving them the chance to make decisions around their projects and letting their voice be heard. One high-achieving student mentioned their teacher "...always encourages us on our projects to do what we want to learn about and go forth with what we're curious about..." showing how they do have voice and choice with regard to their projects. Students also discussed feeling like their teachers help them build self-directedness, as well as support their reflection on their goals during the experience itself. For instance, one student indicated that, when working on a project, their teacher "has this sheet and you write down what you're doing for the day, if you finish that, or if you need to keep going on that," indicating that the students themselves decide what their project goals are, as well as keep track of and reflect upon those goals during the process.

Students also noted how teachers made these classroom deeper learning experiences accessible by scaffolding student growth using supports. Students additionally observed teachers providing clear prompts when giving a frame for these experiences, as well as communicating what content should be understood by establishing learning goal foundations. Students discussed teachers regulating student reflection and provision of feedback during these activities. For instance, one student said,

“...Our teachers like explain a lesson, and then they give us an assignment to do. And then we do it, and if we need help then they help us a little bit more. And then if most of the class needs help then we'll do the same assignment- or not the same assignment, the same lesson- the next day just more in depth, and then if we all get it then we'll move on.”

Here, the student clarifies how their teacher takes an activity and regulates the progress of the entire class by providing scaffolding of the skills and delivering feedback where students may be struggling. Their teacher does this to ensure the learning goals of the task from the beginning, and prompts students to reflect on their own work to indicate if they feel they need support.

SRL components were also discussed by students about how teachers regulated the learning environment and activities. Within the phase of student forethought, students demonstrated that teachers incorporated student self-motivational beliefs through structuring classroom activities around student intrinsic interest and values, as well as managing the expectations students have for the outcome of the activities. Relative to this, one student discussed how teachers would “introduce a little bit about the topic, and it makes me like diving into it a little bit more.” In addition, students noted that within the learning environment teachers prompted students to analyze tasks presented to them by setting goals and planning strategies they would use to approach activities. Another student discussed that one of their teachers “let us use our smartphones and devices like that to set reminders and such” to help them stay on track while they work through projects.

When students were engaging in the activities themselves, they noted teachers fostered their use of task strategies, as well as how students recorded observations of themselves during the task at hand. Student mentioned that when they worked through tasks that “I know I to use my phone, and most of the time I'll just remember stuff in my head. And they have a Google classroom and he posts and stuff.” These concepts as regulated by their teachers help students observe their own progress. Multiple students noted that if they feel behind on this task list, “I usually take one day to focus on the missing assignments, and I wrote it down.”

Finally, after the completion of a class activity, students discussed how teachers impacted their self-judgement and causal attributions, as well as adaptive inferences they may make when reflecting on their performance. For instance, on student noted that when provided guidance by a teacher, that “I don't listen to him (chuckles) telling me to ask questions. So, I guess it's more on me.” Another student noted when independently working through a project, “if you don't have a good teacher to help guide you through that process you might not get any work done. You might...just slack off during class”

Students also pointed out how teachers regulated the learning environment and activities with regard to ideas from growth mindset, including how they helped students persist when faced with obstacles. One student described this as such:

“They talk to me about motivating me and saying like, 'Don't get down, you can feel confident about this. Just think about what you're finishing it how you'll feel and how you'll do it. You try to assess what you have what's good and try to fix what you have that's bad.'”

Students also noted how teachers regulated student curiosity in the learning environment through the promotion of inquiry. For instance, “if somebody asked a question, he doesn't just answer it and move on with like a specific lesson. Like most of the time we go more in depth in those questions.” Additionally, students also noted how teachers promoted self-advocacy in their classrooms by fostering how students provided criticism and suggestions, as well as direct others. Furthermore, in regulating their classrooms, teachers promoted school connectedness by fostering student feelings of being cared for by others at their school. For instance, when thinking about how a teacher supported him and his peers during a project, they said “he always stuck around our table a lot and helped us research and found us good sites and afterwards he said we did a really good job, and it motivated me to do better on the following assignments.” This student’s quote sums up how their teacher regulated their group work by responding and providing support when students self-advocated for help, as well as helped them feel cared for, resulting in persisting motivation for future projects.

Students also perceived teachers approaching the learning environment in a supportive and influential way, with intention, and aiming to use student socialization to create learning communities. Students discussed that, in class, “You can pick groups, you can be with your friends to do projects, and you can research and do whatever projects you want.” This shows how teachers intentionally created collaborative learning environments to facilitate how students received support.

There were also examples of students perceiving contradictory ideas to these concepts while at the same time stating that their teachers did these exact things from

their point of view. For instance, when reflecting on the course of a school year, one student said:

“So the teacher in the beginning he was like this is a free class, you can try to focus on something you want to learn. But now, it's if you don't want to build a kite, I don't care if you don't want to build the kite, you build the kite”

This statement indicates that, while teachers intended to regulate the learning environment and activities in a manner which was centered around the students, in some instances, teachers ended up restructuring classes to be more teacher centric.

Comparing High- versus Low-Achieving Students. High-achieving students generally seemed to think teachers were effective in regulating the learning environment. The way teachers provided learning activities that could be differentiated and allowed the teacher to provide students with personal support and relevant tasks was apparent to these students. For instance, “If you're not working, he'll work with you to make sure you get your work done. And he makes it so you're working independently, but if you need his help, he'll be there.” They also reflected on how the presence of the teacher helped them regulate their goal progress; when they did not have the presence or support of the teacher this was more of a struggle. To help with this in the hybrid class environment, one student mentioned “...my group of teachers where I learn, they post a calendar of each assignment for each subject. So, like on Monday, from math you did this, for science you do this. And you can use that to check off assignments.”

Low-achieving students also noted differentiated instruction and personal support as provided by their teachers for learning activities that were intentionally relevant,

though they did not discuss this as much as the high-achieving students. One student noted that if as the teachers are providing individual support, “if most of the class needs help then we'll do the same assignment- or not the same assignment, the same lesson- the next day just more in depth, and then if we all get it then we'll move on.” These students also indicate they feel that they have agency within the learning environment when setting their goals, and the teacher-provided support helps them regulate themselves and work towards these goals. One student discussed that in this learning environment their teacher “was able to work with you on your stuff. But there's other kids in there that are working on something different, because that's what they need to work on.” While these are similar to what the high-achieving students noted, the low-achieving students also discussed the provision of external rewards by teachers for meeting goals.

Teacher-Guided, Student-Driven Goal Progress. . The theme of “Teacher-Guided, Student-Driven Goal Progress” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how goals were set, tracked, worked towards, managed, and evaluated, and eventually reached in the classroom. They indicated experiencing that, while they drove the creation of the goals, as well as the work put in towards reaching the goals, they perceived their teachers as helping them explicitly state and track their progress, as well as provide other instrumental support in the goal process.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate aspects of the middle and end of these activities. More specifically, students indicated feeling like their teachers help them build

self-directedness by supporting how they reflect on their goals during the experience itself. One student discussed that one of their teachers is “really good about going to people and seeing what they're doing. If they need any help asking questions and stuff.”

In addition, students noted how they reflected on the learning process at the end of the learning activity and shared these reflections and their product with others.

Students also noted how teachers made these classroom deeper learning experiences accessible by scaffolding student growth using supports. Students articulated that “a lot of our teachers make us look back on other projects and see how we can do better and learn from our mistakes from last time on a project.”

SRL components were also discussed by students about how they drove and how teachers supported their goals. Within the phase of student forethought, students demonstrated that their self-motivational beliefs were important to how they thought about their goals, including with regard to their goal orientation and self-efficacy beliefs. One student reflected on this and said “it made me sad when the teachers would just tell me the answers (looks downward), because, I didn't know how to do it and it made me feel not very confident.” In addition, students noted how analyzing the learning task facilitated how they set their initial goals, as well as through the decision of what strategies they would use to approach the task at hand. One student described this process as students setting “little goals that we have to complete. Like I'm working on a video animation, and some other people are working on a brochure, and stuff like that. I feel like we do really good at setting those for ourselves.”

When students were engaging in the activities themselves, they noted regulatory strategies (e.g., self-instruction and attention focusing) and task strategies (e.g., self-consequating) helped them orient themselves towards their goals. They also noted using self-recording techniques to observe their progress towards their goals. One student noted that while they work, “I’m going to get it done as soon as I can, because that was just stressed me out if I don’t.”

Finally, after the completion of a class activity, students discussed how they judged themselves using evaluations, how they felt when reacting to their own performance, and how they reflected on the process they followed as they worked towards their goals. One student mentioned that they would “try to assess what you have what’s good and try to fix what you have that’s bad.” Most student discussed the progress they made, but when struggling, one student described the experience as that it could “make you feel less successful by leaving a project undone.”

Students also reflected on aspects of growth mindset when discussing their goals. They discussed how they sought out challenges and put in effort to reach their goals, and that their teachers supported them in this. Despite the academic challenges they described, one student maintained that with their teachers’ support as they worked towards their goals “the classes are really easy to pass as long as you actually do the work.”

Finally, students also pointed out that teachers were intentional, not only in providing the assignments around which students structure their goals, but also in the ways teachers supported students working towards their goals. As they worked through a

project, one student noted their teacher “always stuck around our table a lot and helped us research and found us good sites and afterwards he said we did a really good job,” summarizing the intentional support provided to the students.

Comparing High- versus Low-Achieving Students. When reflecting on how their teachers supported them in reaching their goals, high-achieving students first and foremost indicated that the goals they worked towards were their own; all goals were chosen with student agency. Additionally, teachers facilitated how high-achieving students worked toward their individual goals, with the intention that students were as independent as possible. Students described that “our projects are our own responsibility, and if we forget something that's on us.” They also summed up how teachers helped them choose the steps and checkpoints to make their goal achievable by stating that “my teachers set like deadline, and tell us like to set little target dates along the way, to help us space up the workload and not get overwhelmed.”

Low-achieving students described their goals as less structured. One student mentioned “we haven't been doing really anything in the past few weeks, but we were working on our project. But our teacher has been absent, so we had a sub. So, we haven't been doing work.” They also indicated that, when deciding their goals, they were allowed less agency than high-achieving students and were provided more direct support by teachers. In fact, one student stated “I don't really like it when people give me decisions. I like it more directed.” They also referred to more extrinsic motivators when working towards these goals. For instance, “we get rewards, like doughnuts and stuff, for doing our work and challenges.”

Supportive and Differentiated Student-Centered Pedagogy. The theme of “Supportive and Differentiated Student-Centered Pedagogy” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how their teachers center their teaching around the individual needs of students to provide each student with a potential for individual growth.

Students experience this through various aspects of deeper learning experiences, including how teachers support and differentiate between students when designing and facilitating learning experiences, specifically during the launch and middle phases of this process. More specifically, students noted how teachers supported students and their needs when choosing their topics. On this note, one student said, “I know the people in my class are very curious about what she's talking about. And our science teacher does a really good job with it, too. He always encourages us on our projects to do what we want to learn about and go forth with what we're curious about and stuff like that.” In addition, students indicated feeling like their teachers supported how they build self-directedness, particularly by facilitating students seeking feedback to differentiate their personal growth. One student discussed how when working through projects and trying to improve, “Especially being in a small group and classes, the teacher was able to work with you by your own or you guys did it as a group.” Students also noted how teachers provided resources to each student to support and scaffold their learning to meet individual needs, as well as ensure that the individual evaluating their final work was not only supportive but also provided differentiated feedback. One student explained that as

they requested support when working through a project, their teacher “helped us research and found us good sites.”

SRL components were also discussed by students about how teachers made sure their teaching was centered around the individual student in a supportive manner. Within the phase of student forethought, students demonstrated that their self-motivational beliefs, including their self-efficacy, were fostered by the support and differentiated instruction provided by their teachers. One student discussed, “I feel like, since all of us are in the advanced math class, he expects higher from us, and I feel like we all respect him and he respects us. So, we know to get the work done.”

When students were engaging in the activities themselves, they noted that their teachers’ support and student-centered instruction helped them exercise self-control through the strategies they used to regulate themselves during the task, including focusing their attention on the task. When asked, one student said the following about how their teachers provided student-centered support during work on projects:

“They respect us enough to know if we're motivated, or need to be motivated. I feel like if the teacher knows, not thinks, that you're being motivated, he or she won't be like 'Hey, are you staying on track, you need to be doing blah, blah, blah.' If you're not staying on track, it pretty much be like... like, they'd come up and help you and stuff. And then once they're done helping the people who really need help, they go around to those groups who are staying motivated. And they ask them about how they're doing and stuff like that, so that way they can keep everybody on track.”

This student indicated that their teacher was aware of the needs of each individual student when working through a task. Finally, after the completion of a class activity, students discussed how their teachers' support and pedagogy impacted how they judged themselves. When reflecting on how they responded to their teacher's support, one student said, "I don't listen to him (chuckles) telling me to ask questions. So, I guess it's more on me."

Students also reflected on aspects of growth mindset when discussing their goals. They discussed how they embraced challenge so they could grow when their teachers centered their teaching around the individual student. This additionally coincided with students also noting being curious when receiving support from their teachers. For instance, "if somebody asked a question, he doesn't just answer it and move on with like a specific lesson. Like most of the time we go more in depth in those questions."

The student-centered pedagogy also influenced the perception of how connected students were to their school, particularly regarding how they were cared for by others at their school. This teacher support and differentiated instruction also fostered student self-advocacy, especially around students being able to appropriately criticize others based on their needs. One student discussed the support they felt from teachers when revising a project. "There were some things I didn't change, though, 'cause I've asked all four of my teachers actually just to see different views of what they would say. So, there's some things I didn't change, but like I had some run-on sentences, and I didn't realize that, and so I had to get that changed and all of that."

Students also pointed out that when teachers were intentional about their impact on the classroom, the students perceived increased support. Students were aware of their teachers using student-centered pedagogy. For instance, one student reflected on this when describing a project that they were working on. “My book is based on manga. So, he doesn't really know what that is. (smiles big) So, I have to look stuff up for him to know what it is.” Furthermore, students also noted being aware of moments when teachers were not providing support and differentiated instruction through student-centered pedagogy, and instead were using teacher-centered pedagogy. One student mentioned that during some instances, “they didn't really like let us research. They kind of gave us questions to answer.”

Comparing High- versus Low-Achieving Students. When reflecting on supportive and differentiated student-centered pedagogy, high-achieving students focused on the large amount of agency with which they were provided. One student discussed how “my group project was making PTSD treatment for retired veterans cheaper, and our teacher was really invested in that.” They also acknowledged awareness of teacher support as they worked towards their goals. They were especially aware of this when they were struggling. For instance, one student said, “If you're not working, he'll work with you to make sure you get your work done. And he makes it so you're working independently, but if you need his help, he'll be there.”

In contrast, low-achieving students touched indirectly on how they had less agency than high-achieving students. One student described how all students were working together on the same teacher-dictated task to grasp a concept: “If most of the

class needs help then we'll do the same assignment- or not the same assignment, the same lesson- the next day just more in depth, and then if we all get it then we'll move on.”

Low-achieving students also noted a less cohesive structure in their classes than was described by high-achieving students. Finally, it seemed through the descriptions of the low-achieving students that the class and the teachers were not quite working together to pursue project goals. One student described this as “we are all in different places at one time.”

Self-Directed Inquiry-Based Projects. The theme of “Self-Directed Inquiry-Based Projects” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how they direct the topics of projects they work on in the classroom to increase their understanding of topics.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate class project learning experiences to that are directed by the students’ questions asked; this is observed during the launch of the activity. At this stage, students use their voice to make choices about the questions developed and strategies used during the project. One student described the projects their class was working on: “We all have little goals that we have to complete. Like I'm working on a video animation, and some other people are working on a brochure, and stuff like that.”

Students also noted the way their teachers framed their projects using student voice and choice, as well as personal relevancy to the students’ interests, allowed the students to be self-directed. In addition, through these self-directed projects, students

noted meeting the foundations and learning goals established by their teachers, including both content and competencies. One student said their project was “on volleyball, I played volleyball for about four years now. So that's something I'm very interested in, and I'm doing like a bunch of the histories and positions.”

SRL components were also discussed by students around how they used their self-directed inquiry during class projects. Within the phase of student forethought, self-directed inquiry was utilized when analyzing the task of the projects, particularly about planning which strategies they would utilize. For instance, one student mentioned that “we're right at the beginning stages of doing our rough draft and finding information,” when describing their progress and strategies on a particular project.

Students also reflected on aspects of growth mindset being fostered during the self-directed inquiry of class projects, rather than fixed mindsets. Student mentioned how their teachers would help them “learn from our mistakes from last time on a project.” These experiences also supported students self-advocating through their self-direction, as well as their curiosity. Students said they “have a lot of freedom. You can pick groups, you can be with your friends to do projects, and you can research and do whatever projects you want.” These project-based experiences allowed students to inquire about these topics, seek out challenges they chose, and deeply process the content. For instance, “the teachers gave you a broad topic to go on, and you kind of just get to explore about that topic on your own.”

Comparing High- versus Low-Achieving Students. With respect to self-directed inquiry-based projects, high-achieving students discussed the agency they were able to

use when working on their projects. They discussed that “they're always letting us self-guide ourselves for our assignment.” In addition to their self-direction, they all touched on the inquiry they practiced, as well as support received from teachers during their progress. One student described this by saying, “if somebody asked a question, he doesn't just answer it and move on with like a specific lesson. Like most of the time we go more in depth in those questions.” Projects were also consistently discussed by all high-achieving students.

In contrast, low-achieving students had much less to say about projects than their high-achieving counterparts; in general, they referred to more class assignments and tasks. One student clarified this: “Each day was something different. So, like, one day could have been poetry, or one day we read a book and you had to answer questions on it.” Project discussion was still present, but not to the same degree. In addition, their work was more supported and less independent than high-achieving students. However, low-achieving students seemed comfortable with this, saying “I don't really like it when people give me decisions. I like it more directed.”

Student Response to Teacher Feedback. The theme of “Student Response to Teacher Feedback” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive not only their teachers’ feedback, as well as how they perceived their own responses to the feedback provided.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate classroom activities, particularly the middle and end portions. Students noted how teacher feedback, particularly when they seek it out

during the activity, helps them build self-directedness. When asked, one student explained this as, “Most of us already know how to be responsible, but they teach us by letting us keep track of papers and turning stuff in.”

They also noted receiving and reacting to feedback from their teachers when sharing the product of their projects. Students also noted reacting to teacher feedback when reflecting and working through feedback after deeper learning experiences, as well as feeling their teachers’ support when they do so. When thinking about how they reflected on feedback at the end of a project, one student said, “a lot of our teachers make us look back on other projects and see how we can do better, and learn from our mistakes from last time on a project.”

SRL components were also discussed by students about how they respond to teacher feedback. Within the phase of student forethought, students noted teacher feedback impacted their self-motivational beliefs, particularly their goal orientation. One student said, “they don't have to give us 'Oh, here's this small goal, small goal, small goal,' they just know that we can get that stuff done until we reach the bigger goal,” clarifying that teacher-provided goal feedback facilitated their progress throughout a project

Students also reflected on aspects of growth mindset being fostered through teacher feedback. Depending on their response to the feedback, students may have experienced a fixed mindset if they saw it as negative, or a growth mindset if they saw it as a way to learn. One student reflected on feedback and demonstrated some aspects of their fixed mindset by saying, “I felt with mixed emotions because certain topics and the

feedback is kinda of harsh,” making them hesitant to try and progress. Another student said, “a lot of our teachers make us look back on other projects and see how we can do better, and learn from our mistakes from last time on a project,” demonstrating how the teacher modeled a growth mindset and imparted that to their students. Teacher feedback also fostered student curiosity through inquiry, as well as allowed them to advocate for themselves by enabling them to provide appropriate criticism. Positive feedback influenced one student, who said, “afterwards he said we did a really good job, and it motivated me to do better on the following assignments.”

Comparing High- versus Low-Achieving Students. When reflecting on student responses to teacher feedback, high-achieving students note that they and their teachers experience mutual respect. In turn, their teachers provide them with agency and independence. One student summarized how they experience this in the classroom:

“They respect us enough to know if we're motivated, or need to be motivated. I feel like if the teacher knows, not thinks, that you're being motivated, he or she won't be like 'Hey, are you staying on track, you need to be doing blah, blah, blah.' If you're not staying on track, it pretty much be like... like, they'd come up and help you and stuff. And then once they're done helping the people who really need help, they go around to those groups who are staying motivated. And they ask them about how they're doing and stuff like that, so that way they can keep everybody on track.”

They also see feedback as a tool for growth as it is positive and gives them areas for improvement. When asked, a student clarified their support from their teacher as “They always like help you with it more than just saying you did it wrong.”

Low-achieving students, however, see things differently. They note experiencing less agency than high-achieving students and more direct support when working through academic tasks. For instance, when editing a project, one student described, “He helps you write it to make it sound good, and you write it and then he’ll tell you what parts you need to fix. And then you go back and fix it and have him review it.” Despite this, low-achieving students still see feedback as a tool for growth, saying, “instead of telling us the answer when they tell us how to do it, it makes me really confident because I’ll know how to do it next time.”

Teacher Intentionality. The theme of “Teacher Intentionality” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how their teachers are intentional when planning and implementing classroom activities.

Students discuss intentionality regarding deeper learning experiences. This was acknowledged when students discussed how teachers designed and facilitated learning experiences as intentional. One student described a progression of a castle project they worked on: “But we get more history and know more about it each class. And then when we finally get to build it, we can present it and actually know what it is and why it was built.”

Additionally, students perceived the scaffolding and accessibility considerations from the teachers as intentional, especially with regards to teacher-provided supports. In addition, students discuss teacher intentionality when setting the foundation and learning goals of student activities, especially about the class content. One student explained the teacher would help them set relevant goals, and then as a support, “she has this sheet and you write down what you're doing for the day, if you finish that, or if you need to keep going on that.”

SRL concepts were also discussed relative to teacher intentionality, particularly regarding the forethought phase. Teacher intentionality heavily impacted self-motivational beliefs. Student mastery goal orientations, student outcome expectations, and the strategies students planned on using were all shaped by teacher intentionality. One student explained, “she taught me how to set like target dates. So, my teachers set like deadline, and tell us like to set little target dates along the way, to help us space up the workload and not get overwhelmed.”

Students also felt that the amount that they felt connected to and cared for by their school was impacted by the intention of their teachers. When working on a project online during hybrid days, a student noted intentional teacher support when they were struggling: “And that was difficult, because we only got to see our partners two days a week. So, he helped us a lot with that via email.”

Comparing High- versus Low-Achieving Students. When comparing high- and low-achieving students with respect to perceptions of teacher intentionality, high-achieving students discussed being on the same page as their teachers regarding class

project goals. They also discussed feeling equally invested in those goals as their teachers. One student summed up these sentiments as, “they never assigned work just for us to do work. They always have some type of benefit after we do it.”

Low-achieving students indicated feeling more focused on the actual content of the work than the goal of the project itself. For instance, one student mentioned of one project, “when we finally get to build it, we can present it and actually know what it is and why it was built.” However, like the high-achieving students, they still indicated great satisfaction in that work. They also indicated understanding how they saw that work fitting into their lives as a whole and understanding their teachers’ intentions. This was described by one student as, “instead of telling us the answer when they tell us how to do it, it makes me really confident because I’ll know how to do it next time”

Knowledge Acquisition and Communication through Self-Directed Inquiry.

The theme of “Knowledge Acquisition and Communication through Self-Directed Inquiry” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how they both own the knowledge they gain from class activities, as well as how they communicate this information to others.

Students discussed how they own and communicate their knowledge through deeper learning experiences. They mention that this emerged primarily when students were sharing and reflecting upon their work, as well as through how teachers framed assignments and prompted students initially. One student reflected on sharing their work with others by saying, “I really like doing [presentations] just because you’re able to build

more of your social skills, and being able to talk to people and being able to present to an audience.”

SRL was also discussed related to student knowledge ownership and communication. This emerged with respect to the intrinsic interests that students had, as well as the use of imagery and self-control. One student described their project by saying, “And I did a graph of what the electoral votes are on the map versus how many the actual votes there are per state to make the Democrats and Republicans.”

Comparing High- versus Low-Achieving Students. With respect to knowledge acquisition and communication through self-directed inquiry, high-achieving students placed weight upon the factor of intrinsic interest. They also discussed having a deep understanding of the content they learned, as well as the ability to express that knowledge fully to others. For instance, “with the presentations and stuff, we're always being told to think about the stuff that we like.”

Very few differences were seen between high- and low-achieving students around knowledge acquisition and communication through self-directed inquiry. Low-achieving students also reflected upon intrinsic interest, deep understanding, and expressing that understanding to others. The largest difference between the groups was that low-achieving students incorporated the role of teachers less frequently when discussing this theme. One student described, “we can present it and actually know what it is and why it was built. And what was the purpose of it.”

COVID. The theme of “COVID” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how the COVID-19 pandemic impacted student experiences.

Students discussed how the COVID-19 pandemic impacted their experiences regulating their own learning. One student described that, “it's definitely different, but it's actually not terrible.” Other students explained that, “We don't really do independent work in our grade, especially with COVID.” Differences due to the public health context were particularly prominent during the reflection phase of SRL; students referred primarily to COVID-19 relative to their causal attributions. For instance, when discussing a project they were working on, one student said their progress was fantastic, “but then COVID happened and completely messed with our entire structure of how are we gonna actually get it done. It was... like it never actually got finished.”

In addition, COVID-19 impacted students’ growth mindsets. One student even said, “I was a little bit more motivated than previous years just because I wanted to just work, and prove to myself that I could learn in like a social pandemic.” In particular, students found themselves embracing challenge and persisting through obstacles. One student summarized their experiences as, “it's been hard staying motivated during the pandemic, but coming back has helped a lot.”

Comparing High- versus Low-Achieving Students. Regarding the impact of the COVID-19 pandemic on students, high-achieving students focused on how the support of teachers and the hybrid schedule allowed them to succeed academically. This was a

struggle for them, particularly with respect to SRL, but the support allowed them to follow through and complete tasks. One student summarized:

“I'd still think that the Wednesday in between is really great for me to just catch up on my work. It makes me feel less rushed, but still keeping me in school days, which just really helped the whole success feeling pull together.”

Low achieving students did not have as much to say about the COVID-19 pandemic as the high-achieving students. They did discuss enjoying their time spent learning during the 2020-2021 school year, stating, “it's been like kind of crazy and different than other years, but it was pretty good.” They also touched on appreciating that they were able to collaborate on classroom tasks by “doing a lot of group work” and enjoyed the support of their peers while doing so.

Overview of Student Voices Regarding Functional Themes. Taken together, the themes regarding the function of the intervention studied indicate that students overall saw that teachers were assigning projects to them with intention and provided support for students to reach their individual goals regarding these projects. High-achieving students focused on agency, self-regulation, and the facilitation of teachers. Low-achieving students tended to have less to say overall, and the notes they did have focused on teachers allowing less agency and providing more direct support.

Student Voices Regarding Perceptions of the Utility of the SLA Intervention

When looking at high- and low-achieving middle school student voices regarding perceptions of the utility of the SLA intervention, six themes emerged. These ideas emerged through a thematic analysis of the focus group transcripts, using both a priori

codes, as well as emergent codes. A summary of these themes can be found in Table 25 below.

Table 25
Themes Related to Student Perception of Intervention Utility from Most to Least Prominent

Title	Definition	Example Quote
Enhancing student motivation	How students how the SLA intervention impacted their motivation towards class activities.	“I saw that when we did do the free learning, whatever we wanted to do, I noticed that some kids would just sit around and do nothing. Because, I don't think they thought about all the things that they could do, and they just thought 'Oh, well, he's not making us do something. So let me get on my phone or something like that.”
Student intrinsic motivation	How students perceive their own internal valuing and drive to complete academic tasks.	“My topic's on volleyball, I played volleyball for about four years now. So that's something I'm very interested in, and I'm doing like a bunch of the histories and positions.”
Student extrinsic motivation	How students perceive the external factors influence their motivation.	“Well, usually, if I get my work done, if I have good grades, they usually let me bring out my Xbox and I play on Xbox during lunch”
Learning environment influences on social-emotional growth	How students perceive the influences of the teachers and students in their community as they go through social-emotional growth.	“It feels like we're all hanging out, having fun, while also learning stuff and just having a conversation.”
Student-centered growth through reflecting on progress towards goals	How students perceive their use of their goal progress to experience their personal growth.	“Instead of telling us the answer when they tell us how to do it, it makes me really confident because I'll know how to do it next time”
Student-centered task engagement influencing student effort	How students perceive how their engagement and effort in academic tasks varied together.	“Sometimes I'm really focused, and I learned a lot in school. Sometimes I just don't know and don't learn anything, and sometimes it can be challenging when you're zoned out and not learning.”
Student performance orientation towards academic achievement	How students perceive how they think about and work towards their goals related to academic achievement.	“When we get bad scores on test we get discouraged to learn and set goals”

Intentional skill building	How students perceive how they build skills in their classes that they can use outside of the classroom.	"I've never been curious about learning math. I just.... it'll help me in the long run, if I do"
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Enhancing Student Motivation. The theme of “Enhancing Student Motivation” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how aspects of the SLA intervention they experienced impacted their motivation felt towards the activities in the class. Two subthemes stood out within the theme: that of “Student Intrinsic Motivation” as well as “Student Extrinsic Motivation.”

Student Intrinsic Motivation. The subtheme of “Student Intrinsic Motivation” emerged from the focus group transcripts. This subtheme refers to the ways in which the middle school students perceive their own internal valuing and drive to complete academic tasks.

Students experience this through various aspects of deeper learning experiences, including how teachers incorporate the students’ personal interests when designing and facilitating aspects of the launch and middle of these activities. More specifically, students noted how they used their personal interests and thoughts when choosing their topics and developing questions to answer when assigned learning activities. For instance, one student explained that “my topics on volleyball, I played volleyball for about four years now. So that's something I'm very interested in, and I'm doing like a bunch of the histories and positions.”

In addition, students indicated feeling like their teachers help them build self-directedness when approaching projects to approach these activities from an angle they find intrinsically interesting. Students also noted how teachers designed these activities from the beginning with the idea that prompts for students would allow students to use their voice to choose what they personally found motivating. One student said, “we would pick a 28th amendment to research on if we could add one.”

SRL components were also discussed by students about how they felt about their personal motivation. Within the phase of student forethought, students demonstrated that their self-motivational beliefs, including their goal orientations and especially mastery goal orientations, were heavily related to their intrinsic interests. In addition, students noted that their intrinsic interest shaped how they analyzed tasks and set goals. One student summarized, “I was gonna say how obviously goals, they're so much easier when you're having fun in the class,” also showing the connection between goals, intrinsic interest, and student causal attributions.

When students were engaging in the activities themselves, they noted their intrinsic motivation drove how they exerted self-control by seeking information when strategizing how to approach the task. Some students mentioned that the intervention “taught us how to research,” and others discussed how they used self-control and seeking information to analyze a task beforehand, “to the point where we knew exactly what we wanted to do, and we just had to do it.”

Students also reflected on aspects of growth mindset when discussing their goals. They discussed how they embraced challenge and put in effort to master an academic

task when they have intrinsic motivation; in contrast, when students did not experience intrinsic motivation, they indicated avoiding challenge. One student discussed their challenge and effort as, “I think if we actually finished it, and it could actually have been a full done project, we could have presented it and stuff. I think it could have been better,” indicating how this student wanted to meet those challenges and grow, despite not being able to. Another student indicated, “when we get bad scores on test we get discouraged to learn and set goals,” showing how they may not believe they can do better when unable to meet a goal.

Students also noted being curious about concepts they found intrinsically motivating, and asked questions, persisted in pursuing, and focused their attention on these ideas. One student said their teachers “introduce a little bit about the topic, and it makes me like diving into it a little bit more.” Finally, students also pointed out that teachers when teachers were intentional about their impact on the classroom, the students experienced an impact on their intrinsic motivation. One student described their experience in the intervention:

“When I did innovation hour, I chose a different one than most people. We were making an aquaponics thing- my tech teacher wanted to build a pond, where we would grow stuff and have fish in it. And so it was a lot different than most of the other ones, because we basically just researched what kinds of ponds we wanted to build. We built a pond.”

This student indicated that their teacher’s purposeful selection of a project prompt impacted their drive to complete the project.

Comparing High- versus Low-Achieving Students. When discussing intrinsic motivation, high-achieving students reflect on the independence and agency entrusted to them by their teachers. One student said their teacher “always encourages us on our projects to do what we want to learn about and go forth with what we're curious about and stuff like that.” This agency cultivates personal relevance and curiosity in high-achieving students involved in the intervention.

In contrast, low-achieving students do not note the same agency. They also tend to discuss their intrinsic interest at a more surface level, while providing less detail in general. More than anything, they seem to enjoy the social context more than the tasks themselves, quite different from what is described by the high-achieving students. For instance, one student said, “It's fun to hang out and do projects together with my friends,” exemplifying these ideas.

Student Extrinsic Motivation. The subtheme of “Student Extrinsic Motivation” emerged from the focus group transcripts. This subtheme refers to the ways in which the middle school students from the school examined perceive the external factors influence their motivation.

Students noted these extrinsic motivators relative to SRL concepts, particularly about their performance goal orientations. One student noted the external influence of their teachers’ expectations by saying, “half the time I just do what they say.” In addition, regarding the performance phase of SRL, students note these extrinsic motivating factors impact the use of task strategies, such as self-consequating, as they use self-control to complete their academic tasks. When reflecting on how they kept track of tasks, one

student said, “you give me something I'm going to get it done as soon as I can, because that was just stressed me out if I don't.”

After completion of the academic activities, students mentioned how these external motivators impact their self-reaction and self-satisfaction. One student mentioned, “I get a perfect score on pretty much everything, which makes me feel happy, I guess.” Furthermore, students noted giving up when encountering obstacles and other components of a fixed mindset relative to extrinsic motivators. Grades were again a salient example of this, with a student stating, “when we get bad scores on test we get discouraged to learn and set goals.”

Comparing High- versus Low-Achieving Students. Regarding extrinsic motivation, high-achieving students had little to discuss, less so than the low achieving students. When they did discuss external motivators, they focused their discussion on the external supports from teachers that help them success at academic tasks. For instance, when discussing hybrid learning environments, students mentioned, “I can never get my work done at home, but at school...it's easier.” Furthermore, with regard to their development of agency during projects, one student mentioned, “if you don't have a good teacher to help guide you through that process you might not get any work done,” indicating their reliance on external supports.

Low-achieving students, on the other hand, mentioned extrinsic motivation more than high-achieving students. When they did so, they tended to discuss tangible motivators. One student mentioned, how teachers were applying these tangible motivators by saying, “If I get my work done, if I have good grades, they usually let me

bring out my Xbox and I play on Xbox during lunch.” Furthermore, they also discussed their affect because of the impact of their extrinsic motivation:

“We have goals on tests. Like in my Spanish class we get rewards, like doughnuts and stuff, for doing our work and challenges. The teachers make it very challenging, but usually get Jolly Ranchers or something when we finish it. And then we set goals on like the big tests.”

For low-achieving students, these external motivators were important to their academic achievement from their perception.

Learning Environment Influences on Social-Emotional Growth. The theme of “Learning Environment Influences on Social-Emotional Growth” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive the influences of the teachers and students in their community as they grow in both social and emotional arenas.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate learning experiences to create learning communities and foster social-emotional growth in students. Students also noted how teachers provided resources to each student to support and scaffold their learning to ensure both learning communities and social-emotional growth are accessible to students. For instance, when planning out a project to ensure the students are able to reach their goals in a satisfying way while preserving positive affect, one student explained, “my teachers set like deadline, and tell us like to set little target dates along the way, to help us space up the workload and not get overwhelmed”

SRL components were also discussed by students with regard to social-emotional growth and learning communities. Within the phase of student forethought, students demonstrated that their goal orientations (both mastery and performance) and outcome expectations were related to the social-emotional influences of their learning communities. One student noted how working with their teacher allows them to want to learn for the sake of the intrinsic value of the content and the enjoyable social context by saying, “It feels like we're all hanging out, having fun, while also learning stuff and just having a conversation.” Another student indicated that when working towards and academic goal, their teachers are “always like, you got this. Then they give really good answers when we ask questions. But like they don't usually give us answers.”

When students were engaging in the activities themselves, they noted how their learning communities fostered their self-control, in particular their attention focusing on the academic task. One student said, “if you don't have a good teacher to help guide you through that process you might not get any work done. You might...just slack off during class,” indicating the importance of the social support of the teacher as students are learning to work through tasks independently.

Finally, after the completion of a class activity, students discussed how their self-judgement, self-reaction, and self-satisfaction were fostered by the social-emotional growth they experienced in conjunction with their learning communities. The social influence on the emotional development of students was described by one individual when discussing teacher support:

“That makes me feel more confident. Sometimes, like in fourth grade, it made me sad when the teachers would just tell me the answers (looks downward), because, I didn't know how to do it and it made me feel not very confident.”

Students also reflected on aspects of growth mindset when discussing their goals; students indicated these learning communities fostered their growth mindsets, rather than fixed mindsets. One student said, when they were struggling, teachers would tell them, “Just think about what you're finishing it how you'll feel and how you'll do it. You try to assess what you have what's good and try to fix what you have that's bad.”

Students also noted being persistently curious through the social-emotional influences of their learning communities. One student talked about how their teacher would talk about concepts of various types and subjects related to current events, saying, “It really keeps us up to date, and just gives us a lot of opportunity to learn things, no matter who you are, you'll probably be interested in it.” These learning communities also influenced the perception of how connected students were to their school, particularly around how they were cared for by others and felt like they were a part of their community at their school. One student discussed how their teacher “has a bunch of motivation posters and she's really talkative. She's a good teacher.” Another student mentioned that similar support would “make us feel like one big family.”

This social-emotional growth within learning communities fostered student self-advocacy as well, with students saying, “you have a lot of freedom. You can pick groups, you can be with your friends to do projects, and you can research and do whatever projects you want.” Students, similar to what this student discussed, also pointed out that

they felt direct teacher support and influence impacted their social-emotional growth, as well as the development of these learning communities. Students were aware of the socialization they gained from the presence of these learning communities.

Comparing High- versus Low-Achieving Students. Regarding learning environment influences on social-emotional growth, high-achieving students tended to focus their comments on what could be learned and gained from these ideas and their community. For instance, one student discussed, “the way the teachers teach can be good, the activities they do,” showing how the class content was helpful to personal growth. They also implied, while enjoying and taking part in the social aspects, they still had a sense of independence.

When compared to high-achieving students, low-achieving students placed more emphases on the social component of these learning communities, rather than the actual knowledge gained. One student mentioned, with respect to their classroom activities, “it's more engaging when you have more people coming in.” Furthermore, they discussed receiving direct support from peers and teachers, emphasizing independence less than the high-achieving students. One student explained this as, “they always encourage us to ask questions, and they're also really good at like reading us? Kind of? Like figuring out what we need help with?”

Student-Centered Growth through Reflecting on Progress towards Goals.

The theme of “Student-Centered Growth through Reflecting on Progress towards Goals” emerged from the focus group transcripts. This theme refers to the ways in which the

middle school students perceive how they used their individual goal progress to experience their own personal growth.

Students experience this through various aspects of deeper learning experiences, including how teachers design and facilitate classroom activities from beginning to end. Students noted how their goal progress and future growth was impacted through use of their voice and choice, particularly with respect to their strategy decisions when approaching their learning tasks. For instance, one student summarized their experience as, “We all have little goals that we have to complete. Like I'm working on a video animation, and some other people are working on a brochure, and stuff like that.”

In addition, students noted how they reflected on their goals during the task through deadlines and “little target dates along the way,” as well as the reflection process and sharing their product at the end of the project, and that this impacted how they grew and developed as a result. Students additionally reflected on how the reflection and feedback processes also fostered this growth. For instance, one student said their teacher “helps you write it to make it sound good, and you write it and then he'll tell you what parts you need to fix. And then you go back and fix it and have him review it,” describing the growth through iterative process of editing a project.

SRL components were also discussed by students about how they use their goal progress to grow. Within the phase of student forethought, students noted that this reflection on their goal progress fosters mastery goal orientations and was most prominent regarding their intrinsic interest. One student summarized as, “They try to make us do responsible ability for learning, so we can like, do things independently.”

With respect to the performance phase of SRL, students noted reflecting on their regulatory strategies as part of the self-control they used when progressing towards their goals. In some instances, this was difficult for students, and other instances it was easier. One student described difficulty with regulatory strategies when working from home in a hybrid learning environment, noting that working from home “left room for lots of procrastination. So, most of the times I wouldn't get my schoolwork done until the last couple of days. Which was kind of... meh.” During the reflection phase, students noted that as a part of reflecting on and accepting their goal progress, they had to evaluate to judge themselves and their learning. One student reflected on their growth after exposure to the intervention, judging skills they had gained, saying, “it definitely taught us how to research, which definitely comes in handy for later grades and later assignments...”

Students also reflected on aspects of growth mindset being fostered through teacher feedback. Finally, as a part of their personal growth, students noted that the effort they used during academic tasks allowed them to adapt a growth mindset. One student reflected on how they put effort into a castle-building project, and summarized their intellectual growth by saying, “we get more history and know more about it each class.”

Comparing High- versus Low-Achieving Students. Regarding student-centered growth through reflecting on goals, high-achieving students noted positive affect during the growth process. They also generally mentioned feelings of overall improvement. These students additionally noted the influence of their teachers during this process. One student integrated all of these pointed when telling an anecdote, indicating that their teacher provided them with resources and skills during a project as they grew, and at the

end, “he said we did a really good job, and it motivated me to do better on the following assignments.”

Low-achieving students had less nuance around their discussion of the growth process. Most low achieving students focused their statements on the individual tasks they completed. For instance, one student mentioned that during their experience in the intervention, “we did some extra English work just because I was not the best at reading, and any type of English stuff. So, I had to get through that.” They also brought up feelings of independence gained through their growth. This was summarized by a student who said, “instead of telling us the answer when they tell us how to do it, it makes me really confident because I’ll know how to do it next time.”

Student-Centered Task Engagement Influencing Student Effort. The theme of “Student-Centered Task Engagement Influencing Student Effort” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how their engagement in academic tasks varied with how engaged they were in the tasks.

Students experience effortful engagement through various aspects of SRL. Regarding the forethought phase, students noted that their outcome expectations impacted the amount of effort they put into an activity, as well as their engagement with that activity. Students indicated that teachers would help effort and engagement by teaching them “how to set like target dates. So, my teachers set like deadline, and tell us like to set little target dates along the way, to help us space up the workload and not get overwhelmed.” Since they are planning, students understand that the result will not be

overwhelming for them. Furthermore, their effort and engagement influences students' abilities to focus their attention on the task, as well as observe their own performance during the task. One student described, "Sometimes I don't really do the work, so they have to keep reminding me, but when I do it, I put a lot of effort into it." They show that teachers facilitate their engagement, and that impacts their effort, and they're able to observe themselves as this occurs.

Students additionally noted that while they were reflecting on and judging themselves their effort and engagement impacted their causal attributions, such as, "sometimes it can be challenging when you're zoned out and not learning." Students also noted relationships between growth mindset and their effortful engagement. Specifically, effort fostered growth mindsets through allowing students to master these tasks. One student clarified that, "Sometimes I'm really focused, and I learned a lot in school." Student curiosity was also related to effortful engagement. Student persistence and attention during tasks they were engaged in indicated their effort and level of curiosity. These experiences resulted in the students describing the intervention as not feeling like their other classes. "It feels like we're all hanging out, having fun, while also learning stuff and just having a conversation."

Comparing High- versus Low-Achieving Students. Regarding student-centered task engagement influencing student effort, high achieving students refer to how they persist through challenges and use these for growth. One student used the COVID-19 pandemic and its impact on education as an example of this, saying that it was challenging, "but it's actually not terrible. It's been a challenge for pretty sure everyone,"

but that they stayed engaged and put effort into tasks, allowing them to succeed and grow despite the challenge. They touched on this growth throughout, saying things such as, “You can do better, and you just have to really try and really focus on it.”

Low-achieving students more frequently discussed struggling to stay engaged in tasks and needing prompts from teachers. For instance, “Sometimes I don’t really do the work, so they have to keep reminding me, but when I do it, I put a lot of effort into it.” Despite this, they do note throughout that they have a desire to be engaged and a desire to put effort into their academic work. One student explained this as, “Sometimes, like in fourth grade, it made me sad when the teachers would just tell me the answers because, I didn’t know how to do it and it made me feel not very confident.”

Student Performance Orientation towards Academic Achievement. The theme of “Student Performance Orientation towards Academic Achievement” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive they think about and work towards their goals related to academic achievement.

Students discuss their goal approaches to academic achievement relative to deeper learning experiences, particularly the tools educators use for evaluation. Students also made connections between their academic achievement and performance goal orientations. One student connected these by saying they found learning during COVID-19 “easier, and my grades have improved a lot more.” Another student noted that, generally, “the classes are really easy to pass as long as you actually do the work.” Furthermore, as students were engaged in academic tasks, students noted observing their

own performance with respect to their eventual academic achievement. For instance, when working at home during hybrid instruction:

“It was like really really hard to stay on doing my work. Because, being at school you have to do it. And then once you're at school, it's like, 'Okay, I have to do this.' There's no getting out of it. So, it's fine, I'll just do it. But at home, you can just lay in your bed and just watch stuff or do stuff that's not your schoolwork, and most of the stuff had your days at like, the end of the week. So, you could just procrastinate that entire time.”

Students also noted, when evaluating and judging themselves at the end of academic activities, they make defensive inferences relative to their performance and goals. Procrastination was discussed again as an example of this as well, with one student mentioning, “I have to get everything done right then and there...I'm going to get it done as soon as I can, because that was just stressed me out if I don't.”

Students also noted that, while they didn't discuss many aspects of student curiosity relative to academic achievement, they did discuss information recall. One student in a class mentioned tasks may be challenging, “but usually get Jolly Ranchers or something when we finish it.” In addition, students also noted multiple aspects of fixed mindsets relative to academic achievement. Specifically, they mentioned giving up when encountering obstacles, avoiding challenge, and feeling threatened by the success of others. One student brought this up by saying, “when we get bad scores on test we get discouraged to learn and set goals.”

Comparing High- versus Low-Achieving Students. With respect to student performance orientation towards academic achievement, high-achieving students looked at performance goals positively. They also viewed performance mindsets as being related to long-term success when they can prove their ability to others. One student articulated this as, “I’ve never been curious about learning math. I just...it’ll help me in the long run, if I do.” In addition, high-achieving students tend to not discuss performance orientations without mastery orientations. One high achieving student summarized:

“I’ve had really positive feedback on most of my work, they always say how it’s great. Like, when they do point out the imperfections it’s more like criticism than like saying you need to do this, or this is bad.”

Low-achieving students have a different perspective about student performance orientation towards academic achievement. For instance, low-achieving students indicated a strong focus on grades with respect to performance. One student mentioned, “I’ve always been pretty happy cause I get like... I get a perfect score on pretty much everything, which makes me feel happy.” They also indicated, similar to high-achieving students, that they wanted to prove their knowledge and skill, such as, “when we get bad scores on test we get discouraged to learn and set goals,” showing how their performance can impact how they wish to build knowledge and skills.

Intentional Skill Building. The theme of “Intentional Skill Building” emerged from the focus group transcripts. This theme refers to the ways in which the middle school students perceive how they build skills in their classes that they can use outside of the classroom.

Students mention perceiving that they are developing generalizable skills relative to their deeper learning experiences. Students note that the frame and prompt teachers present to students allow them to develop skills that are personally relevant. For instance, one student described that during the intervention, “on some days we just like have to draw something that can help us. Like invent something.” Additionally, while students are engaged in learning tasks, they note that self-control, including task strategies such as seeking information, are key to developing generalizable skills, such as, “the best thing I learned was how to research.” Furthermore, by putting in effort to master skills during these academic tasks, students demonstrate growth mindsets and feeling curious, including through seeking challenges and deeply processing concepts, while building these skills. For instance, one person mentioned “instead of telling us the answer when they tell us how to do it, it makes me really confident because I’ll know how to do it next time.”

Comparing High- versus Low-Achieving Students. With respect to intentional skill building, high-achieving students dwelled upon concrete skills, including “the best thing I learned was how to research.” They also articulated that they saw these skills as things they could transfer to other areas of their lives outside of the classroom. One student discussed that during the intervention, “you’re able to build more of your social skills and being able to talk to people and being able to present to an audience.”

Low achieving students had less to say on the topic of intentional skill building. Furthermore, what they discussed was not concrete; instead, low-achieving students discussed more broad ideas, such as being encouraged by their teachers to “ask

questions.” They leaned more towards building skills to function across classrooms so they’ll “know how to do it next time”. However, like high-achieving students, they also mentioned research skills and “finding information”, albeit less so than the high-achieving students.

Overview of Student Voices Regarding Utility Themes. Taken together, the themes regarding the utility of the intervention studied indicate that students overall aimed to apply what they took from the intervention for personal growth and were able to do so with support from their learning community. This was further made easier when they were interested in what they were doing and saw concrete positive results. High-achieving students looked positively upon their personal development across all these themes. Low-achieving students tended to have less to say overall, and the notes they did have focused on external motivators and needing prompts to be able to use learning skills.

Parallels in Student Voices between the Function and Utility of the Intervention

The themes extracted related to the function of the intervention and students’ perceptions of how teachers implemented the class had parallels in the themes extracted related to the utility of the intervention and the practicality of the class that students derived from it. A summary of the relationships between these themes can be found in Table 26 below.

Table 26***Student Perceptions of Relationships between Themes of Function and Utility***

Function Theme	Utility Theme
Teacher regulation of the learning environment and activities	Learning environment influences on social-emotional growth
Teacher-guided, student-driven goal progress	Enhancing student motivation
Supportive and differentiated student-centered pedagogy	Student-centered growth through reflecting on progress towards goals. Student-centered task engagement influencing student effort.
Self-directed inquiry-based projects	<i>No direct utility relation</i> <i>Functionally related to Student Knowledge Ownership and Communication</i>
Student response to teacher feedback	Student performance orientation towards academic achievement
Teacher intentionality	Intentional skill building
Knowledge acquisition and communication through self-directed inquiry	<i>No direct utility relation</i> <i>Functionally related to Self-directed inquiry-based projects</i>

“Teacher Regulation of the Learning Environment and Activities” is directly related to the utility theme of “Learning Environment Influences on Social-Emotional Growth.” The way teachers run their classrooms and the activities students engage in creates the social context that cultivates student emotional growth. A similar relationship can be seen between “Supportive and Differentiated Student-Centered Pedagogy” and “Student-Centered Task Engagement Influencing Student Effort.” Again, the environment that the teachers cultivate through their approaches to teaching impacts how students approach engage in the class activities teachers choose to regulate. “Supportive and Differentiated Student-Centered Pedagogy” and “Student-Centered Growth through

Reflecting on Progress towards Goals” are also related themes. The way teachers support individual students through their teaching gives students the tools to grow as they work towards their individual goals.

Teacher feedback also helps students reflect and grow, and the theme of “Student Response to Teacher Feedback” is related to “Student Performance Orientation towards Academic Achievement.” Students perceived their teachers’ feedback as helpful with respect to their academic success and skill building, and students did note a focus on grades and scholarly achievement. Relatedly, the theme of “Teacher Intentionality” was related to “Intentional Skill Building” as those classroom tasks teachers had students engage in supported how students were able to build abilities they could take outside of the class. Finally, “Teacher-Guided, Student-Driven Goal Progress” and “Enhancing Student Motivation” were related as the goals that students set and the support they received from teachers directly influenced how they continued to be motivated going forward.

Two functional themes did not have a parallel relative to utility: “Self-Directed Inquiry-Based Projects” and “Knowledge Acquisition and Communication through Self-Directed Inquiry.” It is also worth noting that these two themes are related as students used self-directed inquiry while working through projects, and at the end of these projects, students would share the knowledge they gained. Despite this functional connection, the fact that students did not perceive a direct relationship between this function of the intervention and the utility of the intervention is notable.

Chapter Five: Discussion

Overview

The purpose of this thesis was two-fold: to examine if differences were present between high- and low-achieving students enrolled in the same SLA intervention with regard to self-efficacy for SRL, as well as mastery and performance-approach achievement goal orientations; and to examine the perceptions that high- and low-achieving students have of the SLA intervention's implementation and utility. Overall, students enrolled in the SLA intervention demonstrated higher levels of mastery achievement goal orientations than performance-approach orientations. A similar pattern is observed when examining just the extreme high- and low-achieving cases. Furthermore, mastery achievement goal orientations were roughly equal when comparing high- and low-achieving extreme cases. These results are sensible as all students were exposed to the same intervention and teachers trained in intervention implementation, and therefore received the same information and messages. This demonstrates that, regardless of level of achievement, the SLA intervention examined fostered achievement goal orientations and self-efficacy for SRL in participating students.

Through the thematic analysis of the qualitative data, students used their voices to provide extensive feedback on the SLA intervention they experienced. More specifically, high- and low-achieving students provided evidence indicating their experiences of the function of the intervention and how it was implemented. These elements included a reflection upon the learning environment and assignments, as well as teacher behaviors,

including motivational support. Students also provided evidence around their experiences of the utility of the course, and how useful they found it for fostering their achievement goal orientations and self-efficacy beliefs for SRL. Overall, while high-achieving students reflected upon working on long-term projects facilitated by their teachers and based upon student self-direction, low-achieving students told a different story, characterized by a need for more agency regarding project topics and strategies used, alongside more support when learning how to implement study skills.

When looking holistically at the qualitative data, students most frequently discussed ideas related codes having to do with the deeper learning experiences used in the SLA intervention, as well as SRL. When the code frequencies for the specific constructs of interest are tallied, it is observed that low-achieving students spoke more frequently about their overall goal orientations and their performance goal orientations than high-achieving students did. In contrast, high-achieving students placed more emphasis on their mastery goal orientations and their use of SRL strategies with respect to the intervention. When reflecting upon the emergent themes and the focus group data as a whole, these results seem sensible. Low-achieving students discussed specific projects and task goals, as well as succeeding at those specific tasks. In contrast, high-achieving students reflected more upon overall learning, growth, and feelings of success.

Overall, it is also notable that the high-achieving student group had a smaller number of students classified as disadvantaged than the moderate- and low-achieving student groups. As previously discussed, self-efficacy beliefs for SRL and mastery achievement goal orientations are higher in students the higher their socio-economic

status is, and this also correlates with academic achievement (Berger & Archer, 2016, 2018; Bernardo et al., 2015; Cleary & Kitsantas, 2017; Lin et al., 2009). However, when learning environments that support these mindsets are present, students across socio-economic status see benefits, with even low-achieving students seeing increases in these mindsets (Adams & Forsyth, 2013; Smeding et al., 2013). Given that all students surveyed and spoken to within this study reported similar self-efficacy for SRL skills and achievement goal orientations, as well as similar experiences in the intervention, this may indicate that, similar to what is seen in prior research, all students are benefiting from exposure to the intervention, regardless of socio-economic status.

Student Voices Regarding Perceptions of Intervention Function

With regard to student perceptions of the function of the SLA intervention, students noted that teachers have a large influence with regard to that students actually do in the classroom and, despite the SLA-nature of the intervention, many aspects of the classroom are teacher-regulated. This is embodied in the theme of “Teacher Regulation of the Learning Environment and Activities.” Students also noted needing and utilizing teacher support as they work towards their goals, as noted by the theme “Teacher-Guided, Student-Driven Goal Progress.” High-achieving students noted this less so than low-achieving students, clarifying that teachers they worked with during the intervention were more facilitators of the projects than providing direct instruction. Low-achieving students, however, are strictly guided by their teachers, and do not quite get the chance to utilize their agency during their projects.

Students also noted that, during the intervention, teachers were supportive and catered their instruction to individual student needs. This was exemplified by the theme of “Supportive and Differentiated Student-Centered Pedagogy.” Students articulated this when referring to the projects they engaged in during the intervention, as well as the personal relevance of tasks presented by their teachers. For high-achieving students, this support again is perceived and felt through teacher facilitation, but low-achieving students receive more support and less agency. Additionally, the tasks for which students receive support and differentiated instruction, are projects, as discussed. These projects may be group tasks or performed independently, but all are, to a degree, self-directed. This is summarized in the theme “Self-Directed Inquiry-Based Projects.” Low-achieving students noted doing more group work and receiving more support than high-achieving students, as well as noting they did not do as many long-term projects; their tasks tended to be encapsulated in a single class session. In contrast, high-achieving students described doing individual work, or having concrete roles and responsibilities during group tasks during long-term projects taking place over the course of a semester or school year.

In addition to guidance provided by teachers, students also noted teachers using supportive and positive language when providing feedback on academic activities. Students generally noted positive affect in response to this feedback, and this is encapsulated in the theme “Student Response to Teacher Feedback.” Some students did note there were some exceptions, and some instances of harsher feedback. These tended to be paired with reduced motivation and self-efficacy, and increased performance goal orientations where students wanted to prove to others that they were competent, but also

doubted their abilities. However, instances of this were extremely rare and only mentioned a handful of times by students. For the most part students noted intentional supportive feedback by teachers and noted intention in teacher action throughout all aspects of the learning environment; this is summarized in the theme “Teacher Intentionality.” Despite students perceiving teacher actions as intentional, low-achieving students noted this less frequently than high-achieving students. Low-achieving students mentioned the intervention had less structure, substitute teachers, not as much long-term work, and generally less purpose than the high-achieving students discussed.

This pattern of low-achieving students receiving less of the intervention elements than high-achieving students carries forward into the theme of “Knowledge Acquisition and Communication through Self-Directed Inquiry.” This theme shows how students perceive the projects used during the intervention as supportive in building content knowledge, as well as the ability to communicate content knowledge to others. Despite this, low-achieving students emphasized this less, particularly regarding the presentation and communication component of the intervention; however, they did reflect on knowledge acquisition. It is worth considering that, with respect to intervention implementation, low-achieving students did not receive the full product.

That being said, the COVID-19 pandemic and resultant public health context impacted all students and their perceptions of the intervention, both high- and low-achieving students. Given that low-achieving students noted having substitute teachers frequently during their experience of the intervention, there is always a chance that these adverse effects of the public health situation impacted this group more strongly than the

high-achieving students purely due to circumstance. All students, however, noted that the hybrid class environment made it difficult to complete academic tasks, especially during group work for projects, and they required extra teacher support as a result. Had the intervention taken place during a conventional school year, all students' experiences and perceptions of the function and implementation may have turned out differently. As it was, it seems that high-achieving students were facilitated by teachers around their goals and self-beliefs for SRL, and low-achieving students did not receive the same support.

Student Voices Regarding Perceptions of Intervention Utility

Regarding student perceptions of the utility of the SLA intervention utility, the theme of "Enhancing Student Motivation" encapsulates the idea that students perceived the intervention as useful for cultivating their motivation. This theme had two subthemes, with one focusing on intrinsic motivation and the other on extrinsic motivation. With respect to intrinsic motivation, all students overall felt the intervention enhanced this for them, though this was more common for high-achieving students than low-achieving students. Some students did note finding utility for extrinsic motivators in the intervention, such as grades or tangible rewards. This was much less prominent than intrinsic motivation but was still present.

This emphasis on grades and wanting to prove to others they could succeed was also encapsulated in the theme of "Student Performance Orientation towards Academic Achievement." However, grades were not the only goals of many students. Many students noted using the intervention to help them develop specific skills, including skills that teachers intentionally wanted them to build, and being able to take those skills with

them into the rest of their lives. These ideas were summarized in the theme of “Intentional Skill Building.” Students also looked holistically at their own growth experienced during the intervention and reflected on how this growth helped them reach their goals. This was embodied in the theme “Student-Centered Growth through Reflecting on Progress towards Goals.” These themes taken together show how students perceive the SLA intervention they experienced allow them, regardless of achievement level, to use their goals to personally grow.

Personal goals and growth also impacted the level of engagement a student felt when experiencing the intervention; if the intervention and related tasks were relevant to the student, they were highly engaged. If, however, the tasks were not personally relevant, the students had difficulty finding the motivation to engage in the tasks. This engagement was connected to how much effort the students expended on the tasks and is summarized in the theme “Student-Centered Task Engagement Influencing Student Effort.” This idea was consistent across high- and low-achieving students.

Students also noted feeling more engaged in activities during the intervention when working with others, as addressed by the theme “Learning Environment Influences on Social-Emotional Growth.” Being able to connect, communicate, and collaborate with peers allowed students to grow in content knowledge, skills, social aptitude, and emotional wellbeing, particularly during the COVID-19 pandemic requiring students learning in a hybrid environment. Differences were observed between high- and low-achieving students with respect to this theme. High-achieving students reflected on how their learning and knowledge was fostered by the community of their peers. Low-

achieving students, however, placed more emphasis on being able to socialize with their friends during the intervention. With respect to the intervention utility, this is the major difference between high- and low-achieving students, and may indicate that more emphasis needs to be placed on peer learning communities receiving support to foster concepts related to SRL skills (including self-efficacy and goal orientations) when low-achieving students are receiving the intervention so learning and growth is perceived as a greater function for these students.

Student Voices Regarding Perceptions of the Relationship between Intervention

Function and Utility

When students discussed the SLA intervention that they experienced and their perceptions, they provided descriptions allowing connections to be drawn between how they saw the function of the intervention as it was implemented and its utility in their lives. Depending on how their teachers established the learning environment, as well as regulated how the learning environment functioned, students saw that directly impacting their social-emotional growth. This was due to how much they were able to collaborate and socialize with their peers and their teachers as they worked towards their project goals during the intervention. These intervention goals tend to be chosen by the students and supported by their teachers. This personal relevance and voice with respect to goal selection fosters and enhances student motivation.

Because of this individuation and differentiation supplied when implementing the intervention, as well as the support provided by teachers, students can grow because their goal progress is facilitated. Furthermore, this differentiated and supportive instruction is

what provided the personal relevance that allowed students to engage in the intervention. That engagement in turn influenced student effort expended on academic tasks, impacting their subsequent task products. Teacher feedback on those products was typically perceived to be positive by students (with some exceptions), and this in turn was reflected in student performance goal orientations toward academic achievement. Finally, many aspects of how the intervention was implemented were perceived as intentional by the students, especially with respect to how the students developed generalizable skills.

Two functional themes were not clearly described by students as related to themes describing student perceptions of the utility of the intervention: “Self-Directed Inquiry-Based Projects” and “Knowledge Acquisition and Communication through Self-Directed Inquiry.” These two functional themes were perceived to be related to each other as students described that they utilized self-direction when choosing project topics and strategies relative to the goals and prompts laid out by their teachers, and this allowed them to develop their content knowledge, as well as practice communicating this to others. Connections to other themes can be inferred; for instance, students needed to develop presentation and communication skills when expressing ideas to others, and these are skills students could take with them outside the classroom. In addition, the personal relevance of these projects likely enhanced their intrinsic motivation, engagement, and effort. Despite this, none of those connections were explicitly drawn by students in their discussion consistently enough to determine connections between these themes would properly express the experience and perceptions of students. This may indicate that teachers may need to more explicitly show students how projects they

engage in during the intervention can directly relate to their lives outside of the classroom; students understood this to a degree, but not deeply enough to connect that utility to the class content relative to all connected themes.

Connecting Current Findings to Prior Body of Literature

Student Voices Regarding Perceptions of the Relationship between the Intervention and Social-Cognitive Theory

The results as described have clear connections to social-cognitive theory. Beliefs, goals, and emotions and the reciprocal interactions between them drive motivation in social-cognitive theory (Bandura, 1991). Students touched upon the emotional component when discussing some aspects of the intervention, particularly their responses to teacher feedback, especially their affective responses. Beliefs were discussed relative to multiple themes, including “Teacher-Guided, Student-Driven Goal Progress” and “Supportive and Differentiated Student-Centered Pedagogy.” Student beliefs seemed to manifest not only from their own thoughts, but also their learning environment. These impacted student goals, the third component of motivation. Goals were discussed relative to a number of themes and seemed core to the student experience of the intervention.

Social-cognitive research also notes similar reciprocal interactions between thoughts, actions, and environment; this is especially emphasized with respect to the social learning context (Schunk & DiBenedetto, 2020). Particularly with the impact of the COVID-19 pandemic, social context seemed to be important to student perceptions of the intervention. They discussed how support from their teachers and peers not only gave them a sense of community, it allowed them a social outlet during a time of social

disconnect due to public health regulations, and gave them a place to discuss and develop their knowledge and understanding of academic tasks.

Student Voices Regarding Perceptions of the Relationship between the Intervention and Self-Regulated Learning

SRL and its three components were all touched on by students: forethought, performance, and reflection. Prior research has established that students use these three stages to develop their goal orientations and their usable learning strategies. These are more specifically impacted and developed by individual self-beliefs (Bandura, 1991; Panadero, 2014). This is logical based upon the emergent themes observed. Students indicated that prior to a project, they utilized forethought with respect to how they thought about their goals with respect to the task, as well as the strategies they used to approach the task. This was supported and facilitated by the teacher. This was consistently observed and reflected upon for growth throughout the self-directed project.

Prior research has also shown that motivation allows individuals to prioritize their goals. Furthermore, high-achieving individuals may demonstrate more personally relevant goals. The social environment may also foster goal establishment based on resultant self-beliefs and modeled behaviors (Bandura, 1991). This was reflected in students' perceptions of the intervention examined. Students who were engaged in personally relevant projects had more motivation to expend more effort on academic tasks. Additionally, high-achieving students had the agency within the intervention to establish goals personal to themselves and experienced more mastery goal orientations than low achieving students when discussing the intervention. Low-achieving students, in

contrast, took on more performance orientations than high-achieving students. They also did not have the agency to work towards personally relevant goals, and instead worked toward goals established by their teacher.

The impact of agency has been established by prior research. Agency is important to SRL, and can be defined as an integration of cognition, emotion, biology, behavior, the environment, and social contexts (Bandura, 1999; Schunk & DiBenedetto, 2020).

Because the teachers in the social environment of the students restrict what low-achieving students set in terms of goals, and facilitate the goals set by high-achieving students, this exemplifies the impact of the social context on student agency on SRL.

Student Voices Regarding Perceptions of the Relationship between the Intervention and Achievement Goal Orientations

Mastery goal orientations in middle school students have been established to be predictive of self-efficacy and SRL, as well as achievement in middle school students. Prior research has also shown that performance goals are generally correlated with motivation and performance (Keys et al., 2012; Wolters et al., 1996), showing the established impact of the context on goal orientations. Regarding the results of the study, high-achieving students discussed their self-efficacy and their mastery goal orientations more frequently than low-achieving students. This was not reflected as distinctly in the quantitative data but did emerge in the perceptions of the students' experience.

As with other components of social-cognitive theory and SRL, classroom environments impact the goal orientations set by students. A mastery-oriented environment will foster mastery orientations in students, and the same for performance

orientations. Furthermore, the degree of mastery goals is oriented by the degree of performance goals set in a classroom (Skaalvik & Federici, 2016). Regarding the results of this study, those students who described their teachers providing support and demonstrating that the content and projects had intrinsic value showed more mastery goal orientations. For those students who had classroom emphasis on grades, they demonstrated more performance orientations.

A prior study also qualitatively established that certain teacher actions cultivated mastery climates: cultivation of student conceptual understanding instead of memorization; not having students memorize material; being comfortable with student mistakes; encouraging students to have fun learning; spending time on concepts; and giving credit for effort. (Patrick & Ryan, 2008). Students in this study discussed that teacher support was vital to their mastery orientations, and they repeatedly cited examples where teachers provided feedback such that students could grow, as well as providing students with praise when they expended effort.

Middle school is additionally an important time of transition for achievement goal orientations, with mastery orientations decreasing and performance orientations increasing over time. This effect is exaggerated for low-achieving students (Anderman & Midgley, 1997; Dewi & Mangunsong, 2012; Freeman & Anderman, 2005). With the design of this study, it is not possible to examine these changes over time. That being said, low-achieving students did less commonly discuss their goal orientations than high-achieving students. Additionally, high-achieving students more commonly discussed their goal orientations overall, particularly their performance orientations.

Interventions that focus on mastery goal orientations tend to be effective at their intended purpose, as well as decreasing performance orientations and increasing academic achievement (Lonn et al., 2014; DeBacker et al., 2018; Mupira & Ramnarain, 2018; O’Keefe et al., 2013). Again, because data were collected at only one time point during this study it is not possible to tell if this intervention increased or decreased any levels of any goal orientation. However, based upon student perceptions of the intervention, it can be concluded that students felt the intervention fostered primarily their mastery orientations, and to a lesser degree, their performance orientations in some contexts.

Mastery Achievement Goal Orientations. Four emergent themes were perceived by the students to be directly connected to their mastery achievement goal orientations: “Teacher Intentionality,” “Student Intrinsic Motivation” (a subtheme of “Enhancing Student Motivation”), “Learning Environment Influences on Social-Emotional Growth,” and “Student-Centered Growth through Reflecting on Progress towards Goals.” Students perceived teachers as having intention with respect to the tasks assigned, and so aimed to master these for that inherent value, also showing their intrinsic motivation. They also aimed to master the skills and tasks presented in the intervention to personally grow, and monitored their progress, how they felt about it, and the messages provided to them by their peers and teachers to manage that personal growth.

There were few differences in mastery orientations between high- and low-achieving students. the largest difference was, as previously mentioned, the frequency with which each group discussed these ideas. Even relative to the emergent themes, this

was consistent: high-achieving students had more to say on the matter than low-achieving students. Given that low-achieving students were provided with less agency and opportunity to work on their SRL skills when compared to high-achieving students, they may simply may not have had as much exposure. This would indicate that low-achieving students may need increased opportunity to develop mastery goal orientations through teacher intentionality, intrinsic motivators, growth through goals, and social-emotional growth.

Performance Achievement Goal Orientations. Three emergent themes were perceived by the students to be directly connected to their performance achievement goal orientations: “Student Extrinsic Motivation” (a subtheme of “Enhancing Student Motivation”), “Learning Environment Influences on Social-Emotional Growth,” and “Student Performance Orientation towards Academic Achievement.” Students were aware of external influences and motivators they encountered and utilized when engaging in academic tasks. Occasionally these included things such as candy, but often they involved grades and using those to prove their competence to themselves and others. Furthermore, the feedback and interactions they had with others was important to the students regarding gaining approval from others.

In contrast with self-efficacy beliefs for SRL and mastery achievement goal orientations, low-achieving students touched on performance-goal orientations more than high-achieving students with respect to these themes. Extrinsic motivators other than grades were discussed more often by low-achieving students relative to the intervention. Furthermore, this group was allowed less agency than high-achieving students, indicated

they worked in groups for socialization more than long-term tasks and learning, and set more concrete goals related to grades than high-achieving students. This may indicate that, even with the SLA intervention, the goal with low-achieving students is simply to increase their grades, rather than impart them with SRL skills. These students may see more success if this approach shifts to guide low-achieving students to gain the SRL skills that high-achieving students are perfecting, even at the middle school level.

Student Voices Regarding Perceptions of the Relationship between the Intervention and Self-Efficacy for Self-Regulated Learning

Two emergent themes were perceived by the students to be directly connected to their self-efficacy beliefs for SRL. These themes were “Teacher-Guided, Student-Driven Goal Progress” and “Supportive and Differentiated Student-Centered Pedagogy.”

Depending on what students believed they could achieve, students set different goals for themselves. The amount and type of support they received from their teachers, as well as the messages their teachers supplied to them during the intervention, impacted the goals students set and their progress towards those goals. Furthermore, those messages supplied to the students by the teachers, the support and facilitation they received, fostered those self-beliefs.

Because high-achieving students had self-beliefs indicating they perceived they could achieve a great amount, and that this was reinforced by the facilitation of their teachers, they set higher goals and chose more complicated tasks for during the intervention. Low-achieving students, however, received less support and differentiation, instead working on shorter-term tasks that the entire class engaged in (rather than being

personally relevant), and so goals were smaller scale, such as test scores. This difference would indicate that low-achieving students would benefit from more support with respect to self-efficacy for SRL within the intervention.

Self-efficacy for SRL is correlated with mastery goals and academic achievement (Britner & Pajares, 2006; Wolters et al., 1996; Zuffiano et al., 2013). Predictors of self-efficacy for SRL have been shown to be mastery experiences, vicarious experiences, social persuasion, and physiological state (Usher & Pajares, 2006). Students who discussed self-efficacy for SRL in the focus groups drew connections between their self-efficacy for SRL and their goal setting during self-directed projects. They discussed social persuasion by teachers and having the chance to succeed as important to building their self-efficacy for SRL, corresponding with prior research.

Self-efficacy for SRL has prior research establishing middle school as a time of developmental transition. A study on gifted students showed that these students utilized SRL skills more than moderate-achieving students. Self-efficacy for SRL increased in students with grade level, and those with greater self-efficacy used SRL skills more frequently (Zimmerman & Martinez-Pons, 1990). Though this study could not detect any changes in self-efficacy for SRL over time, the data did establish that high-achieving students discussed using SRL skills, as well as their self-efficacy for doing so more frequently than low-achieving students.

Interventions that focus on self-efficacy for SRL and provide students with agency around self-evaluation and learning goals tend to improve self-efficacy for SRL, general self-efficacy, and academic achievement (Kitsantas et al., 2004; Sandhu &

Zarabi, 2019). This impact is prominent in low-achieving students, if they maintain consistent attendance to the intervention, though only for SRL skills in middle school students, rather than self-efficacy for SRL (Cleary & Platten, 2013; Cleary et al., 2017; Peters & Kitsantas, 2010). Again, changes over time could not be detected with this study, and high-achieving students expressed connections between agency, goals, and higher self-efficacy for SRL than low-achieving students. However, the quantitative data showed that low-achieving students had non-significantly different levels of self-efficacy for SRL when compared to high-achieving students. This could potentially imply that the intervention provided these students with some of the support they needed in this arena.

Connections between Quantitative and Qualitative Data Findings

Within the quantitative data, high-achieving extreme case students demonstrated higher levels of self-efficacy for SRL than low-achieving extreme case students, albeit slight and not significant. The reasoning for this may be extracted from the qualitative data. When examining the focus group transcripts and emergent themes, high-achieving students explained a focus on self-efficacy in their SRL skills. They perceive that these beliefs are fostered by their teachers and the messages they receive within their learning environments. They also consistently describe the opportunity to succeed in their learning environment, facilitated and modeled by their teachers.

Similarly, high-achieving extreme case students demonstrated higher levels of performance-approach achievement goal orientations than low-achieving extreme case students, also only slightly and not reaching significant. The qualitative data also present plausible reasons for this phenomenon. The themes which emerge from the focus group

transcripts indicated that high-achieving students demonstrated a focus on good grades and consistent positive feedback and praise from their teachers from succeeding at the academic tasks (which they themselves were facilitating). High-achieving perceive that their teachers and the hard work and intrinsic interest of the students themselves allow them to demonstrate their competence in the classroom, and they discussed this to a greater degree than low-achieving students did.

Interestingly, mastery-achievement goal orientations—those typically associated with the highest levels of academic achievement—were similar across all students who participated in the intervention, including high- and low-achieving extreme cases. While unexpected based upon prior research, these results were expected as all students participated in the same SLA intervention, and this too is reflected in the qualitative data and emergent themes. Both high- and low-achieving students described that the majority of their experiences during the SLA intervention reflected a mastery-environment focused on student intrinsic interests and personal relevance of topics, as well as the ability to generalize skills outside of their classrooms. The way teachers guided their students towards reaching their goals, and the way the students reflected upon these experiences indicates how mastery achievement goal orientations were being cultivated in students participating in the intervention, regardless of academic achievement level.

Educational Implications

It is notable that, due to the COVID-19 pandemic and the subsequent public health restrictions on education, the SLA intervention studied was not fully implemented how it was intended, and this impact was noted in the perceptions of students. Public

health restrictions resulted in a hybrid instructional environment, making it more difficult for students to engage in self-directed projects, more difficult for teachers to provide students with differentiated support since they see students less often, and more difficult for students to collaborate on tasks since they were not able to work together in person as frequently.

Despite these drawbacks and difficulties with implementation, both the quantitative and qualitative data obtained from this study demonstrated that students perceived this intervention fostered self-efficacy for SRL, mastery achievement goal orientations, and performance-approach achievement goal orientations in students enrolled. Even further, students indicated that the intervention fostered the seven constructs of note (curiosity, deep learning, growth mindset, motivation, school connecteness, self-advocacy, and self-regulated learning), as well as social-emotional growth. While no significant differences may have been observed between groups in the quantitative portion of the study, this does make sense as all teachers exposed all students to the same intervention, regardless of achievement. Furthermore, students saw the intervention as effective with respect to reaching goals, gaining skills, and building a social learning community. It would therefore be worth implementing for these students based upon those perceptions, while emphasizing the generalizability and personal relevance of the content to make up for the weaknesses noted by the students during the focus groups.

For high-achieving students, even with the impact of the COVID-19 pandemic, this seems to be a well-rounded, effective intervention that meets most of its educational

goals. Implementing this intervention in other middle schools would allow educators to foster these SRL skills in adolescent students. As previously discussed, this is important due to the developmental transitions occurring at this age regarding the constructs of note, as well as the fact that related interventions typically are not experienced by students until they are transitioning to college.

For low-achieving students, the intervention did not seem to be as effective with respect to the goals of SLA, as well as self-efficacy for SRL, and achievement goal orientations. This was particularly apparent with respect to the function and implementation of the intervention. Low-achieving students discussed having limited agency, needing more direct teacher support, showing reliance on external supports, and using prompts to implement learning skills. These students need more agency around projects and their topics, particularly as this is how the intervention is intended to be implemented. However, for these low-achieving students, it is of increased importance for teachers to instead focus on study skills so low-achieving students can gain the abilities that high-achieving students have already established and take forward into the rest of their academic career.

Overall the intervention revealed no major differences between the high- and low-achieving students. This can be interpreted as being indicative of the intervention helping students to adopt the characteristics of the constructs at hand, namely mastery achievement goal orientations, as well as enhancing their self-efficacy beliefs for SRL skills. Furthermore, it was also noted that, with regard to no major differences being present between the groups, all of the seven targeted characteristics of the intervention

could be interpreted as being fostered in the students: curiosity, deep learning, growth mindset, motivation, school connectedness, self-advocacy, and self-regulated learning.

Recommendation 1

The first recommendation school staff need to be aware of when implementing this SLA intervention involves the amount of agency students are allowed to use.

Students indicated enjoying and getting more utility out of the learning how to learn intervention when they were provided with agency over decisions related to the topics chosen for their projects, as well as the strategies and approaches students utilized for task completion. High-achieving students noted experiencing this frequently, more often than low-achieving students. Low-achieving students, however, not only noted not experiencing much agency with regard to project topics and strategies, but also expressed wanting to be provided with more guidance around utilization of SRL skills.

Recommendation 2

The second recommendation from students for school staff involves student personal interests or relevance. It is important for school staff to ensure that teachers allow students to utilize their personal interests during projects they engage in during the intervention. Students indicated increased engagement and effort when the topics of their projects were personally relevant, even more so when they saw these projects would positively impact their lives outside the classroom. Just as students should be provided with agency, they should have the choice to work on academic tasks they find personally relevant. High-achieving students again noted experiencing this throughout the

intervention, but low-achieving students noted not having this experience as often, and requesting to experience this.

Recommendation 3

SRL skill usage was also noted by students with respect to their needs from school staff during the implementation of the learning how to learn intervention. Students noted that goal setting and planning, self-monitoring, and reflecting, were integral to their experiences of the intervention, as well as their success when approaching the tasks assigned to them during the class. High-achieving students especially noted that teachers facilitated the use of their SRL skills during class projects within the intervention. On the other end of the spectrum, low-achieving students noted struggling to understand when and how to apply their SRL skills; instead of facilitating their growth and use, low-achieving students noted that teachers did not always allow students to use SRL skills, and instead teachers would regulate their learning.

Recommendation 4

As can be observed through the prior three recommendations, low-achieving students noted requesting more of these intervention elements from school staff as compared to high-achieving students. While all students need these components to experience the full effects of the class, it was observed that low-achieving students did not experience the same level of these components that high-achieving students did due to how teachers differed in their implementation of the intervention across student levels of achievement. For all students to benefit from the intervention, it is important for school

staff to emphasize agency, personal relevance, and SRL skill development in all students across levels of achievement.

Recommendation 5

Finally, students noted having an inconsistent experience of the intervention during the 2020-2021 school year. Furthermore, the reports provided by high- and low-achieving students through their voices on their perceptions of the intervention indicated that each group's experience of the intervention was different from the other. Especially as differences in agency, personal relevance, and SRL were noted as related to this, and these elements are core to the intervention, it is therefore important that teachers receive professional learning opportunities to give them the tools to consistently implement the intervention across all students.

Notes for Teachers

Based upon the above information, there are a number of things teachers should note when implementing SLA. First, high-achieving students noted a number of teacher behaviors they found effective when participating in the intervention with respect to their individual success. First, teachers would provide content instruction around a general topic, but when assigning a project the students had to take on with respect to that topic, they allowed students to have agency around the subtopic they would do their project on and the strategies the students would use to execute that project. Additionally, high-achieving students noted that teachers primarily acted as facilitators when it came to teaching this demographic of students how to utilize their study skills within the realm of the intervention, including goal setting and SRL skills.

Teachers should also note that different approaches would need to be utilized when working with low-achieving students within the context of an SLA course to ensure the success of this demographic of learner. Low-achieving students noted a lack of agency and personal relevance with respect to the assignments they experienced while participating the intervention; they voiced a need for increased use of their intrinsic interest when taking on academic tasks. Furthermore, this group of students noted feeling lost with respect to how to tackle the academic tasks presented to them in the intervention and struggling to implement their study skills. Teachers would therefore find it important to design activities and projects for low-achieving students that allow them agency with respect to topic selection and project strategy approach, while also providing specific guidance to low-achieving students around how to apply study skills during completion of the assignment.

Notes for School Administrators

To ensure the success of teachers and students when implementing SLA classes, school administrators should be aware of certain concepts. First, as high- and low-achieving students voiced, it seemed that these students experienced different intervention implementation with respect to the agency allowed regarding topic selection and strategy use, as well as the level of facilitation experienced around study skill fostering and use, despite receiving the same messages cultivating mastery achievement goal orientations. High-achieving students described experiencing facilitation of growth and application of their study skills, as well as agency when engaging in classroom projects. Low-achieving students, in contrast, requested more agency around class

activities, and increased support when learning how to regulate their own learning. It would therefore seem to be important for school administrators to provide ample professional development opportunities for teachers to ensure, not only that they understand the numerous components of SLA interventions, but also understand the different needs of high- and low-achieving students in these contexts. This would help ensure consistent implementation of the intervention across teachers, providing a foundation for the academic success of all students.

Limitations

The present study has several limitations. The first limitation exists in the sample size. Due to the small size of the sample, the degree of statistical power (i.e., ability to detect the intervention effect) could be undermined. To make up for this, a mixed-methods approach has been applied to examining the data. Through this approach, insight is still able to be gained with regard to SLA implementation in “learning how to learn classes” based on how this intervention is provided in this middle school. Furthermore, should students enrolled in this intervention be able to be followed longitudinally, it would then be revealed if this type of SLA intervention has a true impact on long-term motivational beliefs and academic achievement. It would also open up the opportunity to examine this intervention across a wide range of subject areas, beyond just the mathematics domain utilized in this study.

Second, confounding variables and selection bias are also present; this is particularly relevant with respect to the intervention and control groups as students and their families self-selected whether their courses would be taken online or in a hybrid

instructional format, as well as enrollment in the intervention. While controlling for this selection bias and other confounding variables may be outside the scope of this proposal, due to the research questions at hand, it is important to still analyze the constructs of interest. Further studies with larger sample sizes, in subsequent school years, or at different schools could replicate this analysis and contribute to understanding the validity of the results.

Related to the above limitations is that this study does not have a control group not exposed to the intervention. Circumstantially, a small number of students ($N = 7$) who did not experience the intervention responded to the surveys. This number was not large enough to use for statistical analyses, disallowing a comparison between the intervention group and control group students. This prevents an examination of the impact of the intervention when comparing those students to those who have not experienced it. Similar problems were encountered with learning environment groups: no fully face-to-face classes occurred for students, the intervention was only implemented in a hybrid environment, and not enough control students were available to look at both hybrid and fully-virtual learning environments with respect to self-efficacy for SRL and achievement goal orientations. Such an examination would have been valued to have a well-rounded view of the implementation and effectiveness of the intervention.

Sample size issues also impacted the ability to determine both the high- and low-achieving extreme cases. Some students did not complete all of the quantitative instruments, causing the achievement range of the extreme cases to need to be expanded so enough students were in each group that statistical analyses could be reasonably run in

a way that conclusions could be drawn about these extreme cases. In addition, it is worth noting that the low-achieving focus groups were smaller than is optimal, with both focus groups having fewer than four students participating. In addition, these small numbers occurred in part because one low-achieving student accidentally attended a high-achieving focus group, and another low-achieving student had technological issues preventing them from using their microphone and speaking aloud during the focus group, and instead had to type their responses to questions and comments in the chat box of the application used to conduct focus groups online. Furthermore, one focus group participant declined to complete the surveys for the quantitative portion of the study.

Additionally, as mentioned earlier, the intervention was not fully implemented as intended due to the COVID-19 pandemic. It is unclear if the issues with the sample in discussed in the prior two paragraphs were due to reverberating effects of the public health context during the academic year when data were collected; however, it would be reasonable to conclude this was the case as potential participants may not have had the time or energy to respond to surveys and participate in focus groups. This caused a similar problem early in the development of the study; originally pretest data and posttest data were intended to be collected; instead, to be flexible for the needs of the participants, only one set of data was collected, resulting in less time spent by the participants, making participation more accessible. This again limited the number of comparisons and statistical analyses run in the quantitative portion of the analysis.

Finally, it is worth addressing the differences between the groups examined in the study. The subgroups of the students in the sample utilized did not proportionally reflect

the representation of subgroups throughout the student populations in the school. This does provide difficulty in making inferences from the sample to the greater population, as well as beyond to other middle school populations. In addition, in the groups that were observed, no differences were observed, indicating that the low-achieving students may have had room to grow within the intervention, but high-achieving students experienced a ceiling effect. Because data was collected at only one time point and with a sample not proportional to the population, this does make inferences difficult, though it does open avenues for future research.

Future Research Directions

Based upon these findings, future research should be used to revise and refine teacher training. Such revisions could focus on ensuring low-achieving students are given the same agency as high-achieving students, that all students are provided with the tools they need to develop SRL skills, and foster mastery goal orientations. Furthermore, it would be worth exploring if being able to implement the intervention as fully intended during a typical school year leads to different, or even improved results.

Future quantitative research on similar SLA interventions should also examine differences across other domains with respect to self-efficacy for SRL and achievement goal orientations. For instance, examining the effectiveness of the intervention when implemented in face-to-face, hybrid, and virtual learning environments could help understand the best medium to implement the intervention in, as well as examine areas in which the intervention could be improved in the less-optimal media. Furthermore, should the intervention be effective through learning environments other than face-to-face, this

would improve accessibility and equity for students who may not normally have access to such an intervention or even in-person schooling, for various reasons. Similar examinations could be done across socioeconomic status and gender for students enrolled and not enrolled in the intervention to see if this SLA intervention was effective in reducing observed achievement gaps.

Finally, generalizability of the results should be explored. Only 7th and 8th grade students were examined in this intervention, despite the middle school examined also having 6th grade students enrolled. Because in some (but not all) areas, 6th grade is a part of middle school, it would be worth exploring if the intervention's effectiveness extends to this grade level. Second, generalizability could also be explored with respect to the school setting. The school examined is a rural school, which limits the external validity of these findings to such rural settings. It would be worth exploring if this intervention is effective in other rural settings, as well as urban and suburban settings.

Appendix A

IRB Approval Form



Office of Research Integrity and Assurance

Research Hall, 4400 University Drive, MS 6D5, Fairfax, Virginia 22030
Phone: 703-993-5445; Fax: 703-993-9590

DATE: July 29, 2020

TO: Anastasia Kitsantas, PhD
FROM: George Mason University IRB

Project Title: [1610811-1] Fostering Student-Led Assessment & Self-Regulated Learning in Middle Schools
Reference: OSP #120621
SUBMISSION TYPE: New Project

ACTION: APPROVED
APPROVAL DATE: July 29, 2020
REVIEW TYPE: Expedited Review

REVIEW TYPE: Expedited review categories #5 & 7

Thank you for your submission of New Project materials for this project. The George Mason University IRB has APPROVED your submission. This submission has received Expedited Review based on applicable federal regulations.

You are required to follow the George Mason University Covid-19 research continuity of operations guidance. You may not begin or resume any face-to-face interactions with human subjects until (i) Mason has generally authorized the types of activities you will conduct, or (ii) you have received advance written authorization to do so from Mason's Research Review Committee. In all cases, all safeguards for face-to-face contact that are required by Mason's COVID policies and procedures must be followed.

Please remember that all research must be conducted as described in the submitted materials.

Please remember that informed consent is a process beginning with a description of the project and insurance of participant understanding followed by a signed consent form unless the IRB has waived the requirement for a signature on the consent form or has waived the requirement for a consent process. Informed consent must continue throughout the project via a dialogue between the researcher and research participant. Federal regulations require that each participant receives a copy of the consent document.

Please note that any revision to previously approved materials must be approved by the IRB prior to initiation. Please use the appropriate revision forms for this procedure.

All UNANTICIPATED PROBLEMS involving risks to subjects or others and SERIOUS and UNEXPECTED adverse events must be reported promptly to the IRB office. Please use the appropriate reporting forms for this procedure. All FDA and sponsor reporting requirements should also be followed (if applicable).

All NON-COMPLIANCE issues or COMPLAINTS regarding this project must be reported promptly to the IRB.

This study does not have an expiration date but you will receive an annual reminder regarding future requirements.

Please note that all research records must be retained for a minimum of five years, or as described in your submission, after the completion of the project.

Please note that department or other approvals may be required to conduct your research in addition to IRB approval.

If you have any questions, please contact Kim Paul at (703) 993-4208 or kpaul4@gmu.edu. Please include your project title and reference number in all correspondence with this committee.

GMU IRB Standard Operating Procedures can be found here: <https://oria.gmu.edu/topics-of-interest/human-subjects/>

This letter has been electronically signed in accordance with all applicable regulations, and a copy is retained within George Mason University IRB's records.

Appendix B

Patterns of Adaptive Learning Survey (PALS)

Here are some questions about yourself as a student in Innovation Hour. Please circle the number that best describes what you think. There is no right or wrong answer.

<u>Personal: Mastery Goal Orientation (Revised)</u>	Not at all true	Usually not true	Somewhat true	Usually true	Very true
	1	2	3	4	5
It's important to me that I learn a lot of new concepts this year.					
One of my goals in class is to learn as much as I can.					
One of my goals is to master a lot of new skills this year.					
It's important to me that I thoroughly understand my class work.					
It's important to me that I improve my skills this year					

<u>Personal: Performance-Approach Goal Orientation (Revised)</u>	Not at all true	Usually not true	Somewhat true	Usually true	Very true
	1	2	3	4	5
It's important to me that other students in my class think I am good at my class work.					

One of my goals is to show others that I'm good at my class work.					
One of my goals is to show others that class work is easy for me.					
One of my goals is to look smart in comparison to the other students in my class.					
It's important to me that I look smart compared to others in my class.					

Midgley, C., Maehr, M.L., Hruda, L., Anderman, E.M., Anderman, L., Freeman, K.E., Gheen, M., Kaplan, A., Kumar, R., Middleton, M.J., Nelson, J., Roeser, R., & Urdan, T. (2000). Manual for the Patterns of Adaptive Learning Scales (PALS). Ann Arbor, MI: University of Michigan.

Appendix C

Self-Efficacy for Learning Form—Abridged (SELF-A; Adapted for Middle School Students)

INSTRUCTIONS: Using the scale provided, please indicate how much each of the following statements reflects how you typically are. There is no right or wrong answer.

How OFTEN do you do the following things when you do homework or study for Innovation Hour?

How often do you do these things when doing homework or studying for Innovation Hour?	1 Never	2 Not very much	3 Sometimes	4 A lot	5 Always
1. I have a goal when I study.	i	i	i	i	i
2. I try to study in a quiet place.	i	i	i	i	i
3. I make a schedule to help me organize my study time.	i	i	i	i	i
4. I carefully organize my notes so I don't lose them.	i	i	i	i	i
5. I finish all of my homework before I play video games or play with my friends.	i	i	i	i	i
6. I wait to the last minute to start studying for upcoming tests.	i	i	i	i	i

7. I make pictures or diagrams to help me learn concepts.	i	i	i	i	i
8. I look over my homework assignments and check my understanding.	i	i	i	i	i
9. I ask questions in class about things I don't understand.	i	i	i	i	i
10. I quiz myself to see how much I am learning during studying.	i	i	i	i	i
11. I review my test to figure out what I missed.	i	i	i	i	i
12. I can tell when I don't understand a concept.	i	i	i	i	i

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Appendix D

Semi-Structured Focus Group Protocol

Thank you for taking the time to talk to us. You all have been asked to join this small group of students to talk to us about the way you like to learn and your experience with Innovation Hour. This is called a focus group. The reason for this research is to see what schools can do to help all students, like you, become better learners in the STEM areas (science and mathematics). The focus group will last about 20 minutes and it will be recorded. Do you have any questions?

Present Classroom Environment and Student-Led Assessment	<ol style="list-style-type: none">1. How are some ways you would describe your learning experience so far this school year?<ol style="list-style-type: none">1. <i>Probe:</i> Can you tell me about your successes and challenges (e.g., staying motivated and engaged in doing your schoolwork)?
Motivation and Self-Regulated Learning	<ol style="list-style-type: none">2. Are you familiar with Innovation Hour? Can you describe how it is different from your other school classes? Can you walk me through a typical session?<ol style="list-style-type: none">1. <i>Probe:</i> What are some of the coolest things that you have learned in Innovation Hour? Do you think that you would have learned something like this in your regular classes?3. In your classroom, how do your teachers help you learn to work independently? If so, can you describe what that looks like? Can you give an example in hybrid and face-face learning environments?4. Now, please take a look at these seven statements <i>(put the statements below in the chat box)</i> and tell me if your teachers do any of the following in your classroom. Could you rate these from 1 (never) to 7 (very frequently)

	<p>Teach you to become self-responsible for your learning</p> <p>Teach you to “speak up and ask questions” for yourself</p> <p>Teach you to self-reflect on your learning</p> <p>Tell you that that you can grow your intelligence</p> <p>Motivate you to learn (setting goals and feeling confident)</p> <p>Make you curious about learning</p> <p>Make you feel that you belong in school</p>
	<p>5. What are some reactions you’ve had about the feedback you’ve received from your teacher?</p> <p>1. <i>Probe:</i> Can you describe an example?</p>
Reflection on Innovation Hour and Learning in School	<p>6. What have you learned from your participation in Innovation Hour? How do you think this experience will help you in the future?</p>
	<p>7. What are some things you wished you learned about during your experience in Innovation Hour? Do you all have any suggestions on how we can improve Innovation Hour?</p>
	<p>8. Are there other things you would like to share about your learning experience in school this past year?</p>

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Biography

Beth Hosek received her Bachelor of Science from George Mason University in 2015 in the field of Neuroscience. She was employed as a Registered Behavior Technician doing Applied Behavior Analysis therapy with children in with Autism spectrum disorders from 2015-2020. She also taught martial arts classes to students of all ages, as well as provided academic tutoring for high school students at this time. She received a graduate certificate in Cognitive Neuroscience from George Mason University in 2020.